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The Cardiff Conference

A few years after the Institute of British Foundrymen received its Royal Charter, there was an unofficial meeting of an equally unofficial, yet somehow authoritative executive, which decided the policy that its officers should be drawn from those who had made serious and prolonged contributions to its welfare. Such a policy is basically excellent, for it ensures that any person accepted for membership has potentially the presidential chair in his tool kit.

The road to high office in the Institute is better marked than is most, as the highway leads through continuous participation in branch and committee activities. The immediate past-president—Dr. A. B. Everest; the newly-elected president, Mr. H. J. V. Williams, and the two vice-presidents, Mr. J. Blakiston and Mr. A. E. Peace, all have achieved their positions by sheer hard work for the Institute. Moreover, this assiduous attention to the Institute's interests usually becomes such a habit that it continues long after the terms of office expire. The unwritten rule that the president-elect has some influence as to the choice as to where the conference is to be held is generally to be commended, as each fresh community becomes aware of the importance of the foundry industry so splendidly serviced by the Institute. In this respect, the Cardiff Conference was an outstanding example and it is reasonably certain that the civic authorities and local businessmen now have a better appreciation of the high position the foundry holds in the general economy of the country.

The conference, which attracted some 400 to 500 persons, was carried through with that perfection of organization invariably to be associated with the Institute, though attendance may have suffered a little through the counter-attraction of the forthcoming International Congress at Düsseldorf, for which function registrations are now of the order of 200 from this country. The indebtedness of the members to the outgoing president and the welcome given to Mr. Williams were both sincere and warm. At Cardiff, the technical sessions, social events and works visits alike reflected great credit on the head-office staff and the local committee. It did no harm for a senior official to " let the cat out of the bag " by disclosing to the meeting how every item was tied to a minute-by-minute schedule. Such a revelation provides the clue to why IBF affairs seem to run on oiled wheels in contrast to some meetings where agenda are but half dealt with. The new president can rely on enthusiastic receptions when he visits the various branches, and in these rather strenuous duties we wish him, that which he richly deserves—good health and a successful year of office.

G

Correspondence

DUST AND FUME EXTRACTION IN FOUNDRIES

To the Editor of the FOUNDRY TRADE JOURNAL.

SIR,—I have read with much interest your publication of Mr. Wilkins' paper on the subject of dust and fume extraction in foundries (JOURNAL, May 31, p. 381) and feel sure that he will not mind my drawing your readers' attention to some statements which, if not fully understood, could be very misleading.

Throughout the paper, Mr. Wilkins refers to the velocity at the exhaust hood without reference to the volume. In all cases of fume and dust extraction, due consideration must be given to the volume to be exhausted, in addition to the velocity at which it is exhausted. These two factors are intimately related and take into account such factors as temperature, volume of fume produced, sand:metal ratio, cross draughts, etc. Furthermore, the reader may be led to understand that the examples quoted by Mr. Wilkins are typical of foundry applications. Whilst not suggesting that these examples may not be suitable for a specific purpose, they should not be taken as being typical of all problems. A useful rule-of-thumb calculation is to allow at least 400 cub. ft. per min. of exhaust per sq. ft. of grid area. On this basis a 6 by 4 ft. knockout would require 9,600 cub. ft. per min. exhaust, a figure considerably in excess of those quoted by Mr. Wilkins. In this context, I would recommend readers to consult the recently published report on the BCIRA Dust Control Conference.

In connection with down-draught hoods, Mr. Wilkins appears to have more faith in this method of control than was indicated by the recent report of the BCIRA Atmospheres Committee of which Mr. Wilkins is a member and whilst the example quoted may in actual fact be working satisfactorily, readers are advised to study the findings of this report.

The efficiencies quoted for wet collectors are very much on the conservative side, as equipment is on the market having an efficiency of up to 95 per cent. in the 5-micron range and thus compares very favourably with the bag filter.

Electrostatic precipitators may in actual fact be used either as primary or secondary collectors depending on the type of dust to be handled. It is most unlikely, however, that they will be used in conjunction with a wet-type of scrubber and particularly for foundry dust.—Yours, etc.,

A. W. EVANS, M.I.H.V.E.
General Sales Manager.

Air Control Installations,
Limited,
Ruislip, Middlesex.
June 15, 1956.

Latest Foundry Statistics

According to the *Statistical Bulletin* of the Iron and Steel Board and British Iron and Steel Federation, there was no change in employment in steelfounding when the figures were returned for April 7. The figure stood at 20,260, but there was an increase of 20 men and a corresponding reduction in women employed. The average weekly estimated production of steel castings during April was 6,300 tons the same figure as for March, but 700 tons higher than April 1955.

Re-casting of Bow Bells

Mears & Stainbank, of the Whitechapel Bell Foundry, London, E.1, are now engaged in the re-casting of the ring of 12 bells for the Parish Church of St. Mary-le-Bow, Cheapside. The church and its bells were destroyed in the air-raids on London in May, 1941, but a large part of the metal was salvaged and is being used again in the casting of the new bells. The firm's connection with these bells goes back to 1738, when the tenor bell was re-cast, and it still possesses the strickle used at that time, as a museum piece. In 1762, the remaining nine bells were cast and finally the two trebles were added to complete the 12 in 1881.

The new bells will bear biblical inscriptions and each is being named at a simple ceremony at the foundry during the casting. The three smallest are being named by the bellfounders, bellringers, and the architect. The next eight by the churchwardens of the associated parishes whose churches are not being rebuilt, and the tenor by the churchwardens and the vestry clerk of St. Mary-le-Bow. The Lord Mayor of London, Sir Cuthbert Ackroyd, who is churchwarden of All Hallows, Honey Lane, is naming the 11th. Each bell will also have a decorative border of London Pride cast in relief just below the sound bow. Our illustration shows the casting of one of the bells.

See also "Four Centuries of Bellfounding," JOURNAL, March 21, 1950.—EDITOR.

Institute of British Foundrymen

Annual General Meeting in Cardiff

The fifty-third annual general meeting of the Institute of British Foundrymen was held in the Park Hotel, Cardiff, on June 13, Dr. A. B. Everest, the retiring president, in the Chair.

Minutes.

On the motion of Mr. F. Arnold Wilson, seconded by Mr. J. K. Smithson, the Minutes of the previous annual general meeting, held in London on June 20, 1955, and which had been circulated, were taken as read; they were confirmed and signed.

Annual Report

THE PRESIDENT presented the Annual Report of the Council* for the year ended April 30, 1956, and proposed its adoption. Commenting on some of its contents, he drew attention to the statement "that the future of the Institute and its influence depend on the growth of its numerical strength. From this point of view, the rate of recruitment achieved, falling as it does so far below the target of drawing all qualified foundrymen within the orbit of the Institute, remains somewhat disappointing." He emphasized that statement because he felt that probably all members were in a position to influence their colleagues to join the Institute. He also urged that they should persuade those who joined to become full members because it was important that the Institute should derive as much co-operation as possible from the membership. He asked that all members should bear that in mind during the present year.

The president was glad to report that during the past year the Tom Makemson Memorial had become established. As a result of the appeal that was made there were sufficient funds to implement the proposals, and the first award would be made this year.

In connection with branch activities he expressed thanks to all the officers of the branches for their work during the past year. The Institute was known in this country, he said, as one of the most active technical institutes, and the activity lay mainly in the branches. The overseas branches, in South Africa and Australia, were also flourishing. He congratulated the Lancashire branch on having attained its half-century during the period under review. Again, he thanked the Lancashire branch for having formed the Stoke section, and the East Midlands branch for having formed the Northampton group into a section. The Council had noted, too, with a good deal of appreciation, the efforts made in some of the branches to draw in and to interest apprentices. He also thanked the officers of the Bristol branch, in particular Mr. D. A. Richards and Mr. G. W. Brown, for their work in making the National Works Visit Day, in October last, so great a success.

* Printed in last week's issue of the JOURNAL.

As to international co-operation, he said that during the past year the Institute had gained in strength and in appreciation abroad. The International Congress held in London was undoubtedly a success, and he had heard many expressions of appreciation during his travels amongst some of the foreign associations during the past year. The Institute's international liaisons had certainly been strengthened.

MR. JOHN BELL (past-president), in seconding the adoption of the Report, said the number and grading of the Institute's members needed very careful attention, and in this connection he endorsed the president's remarks. During last year the addition to membership was only 3 per cent., and it was not enough. The success of the work done in forming sections at Stoke and Northampton was a reflection of the good work that was being done in all the branches. He also drew attention to the section of the Report relating to the formation of an Appointments Register, which he felt would help the membership very much indeed.

(The Report was adopted.)

Balance Sheet and Accounts

In the absence of Mr. Noel P. Newman, J.P. (hon. treasurer), who had only just returned to this country from the United States, THE SECRETARY (Mr. G. Lambert) presented the Balance Sheet as at December 31, 1955, and the Statement of Accounts for the year 1955. Printed copies of these, he said, had been in the hands of members for some weeks, and he would endeavour, on behalf of the hon. treasurer, to answer any questions by members.

Mr. Lambert commented that what might seem to be a substantial surplus of income in 1955 might be rather misleading. The Council had drawn up a budget for the present year's expenditure, and the surplus at the end of the year would be very small indeed, if there were a surplus at all.

THE PRESIDENT added that the Council and executive were looking at the Balance Sheet with some concern and they would have to review the position and possibly put forward some proposals to strengthen it. The Institute suffered, as did everybody, from the rise in the cost of living.

MR. JOHN BELL, proposing the adoption of the Balance Sheet and Accounts, first paid tribute to the good work of Mr. Newman, the hon. treasurer, in this and previous years, and to Mr. Lambert for all that he had done. In nearly all businesses, he continued, care had to be exercised in respect of a number of matters, and in the case of the Institute, the basic factor was membership. Although there had been an increase of 3 per cent. in membership during the past year, the amount received in subscriptions in that year was nearly £400 less than in 1954.

IBF Annual General Meeting

MR. J. G. BAILES seconded the resolution and, in endorsing Mr. Bell's remarks, said it was pleasing that the Institute had so good a staff to look after its interests.

(The Balance Sheet and Accounts were then formally adopted.)

Report of the Technical Council

MR. A. E. PEACE (chairman of the Technical Council of the Institute) presented its report, which had been circulated with the Council's Annual Report. He felt it would be agreed that the year had been one of satisfactory achievement, and three of the Technical Council's sub-committees were presenting the results of their work to the present annual conference. The work had covered a very varied field, and he believed it would be agreed that the reports were of considerable merit.

Some five or six sub-committees had carried their work to a stage at which interim reports were well worthwhile. In much of the sub-committee work it was felt that it would be of benefit to members generally and would assist in the progress of the work if interim reports could be published and discussed, and the Technical Council would welcome additional facilities which would enable the work to be reported to members at intermediate stages.

Next year there would be further work completed, and the Technical Council looked forward to the publication of the "Atlas of Microstructures," which it was believed would be a unique publication, covering as it did the structures of castings in iron, steel and non-ferrous alloys.

He emphasized the Technical Council's appreciation, which was acknowledged in the report, of the co-operation that had been given, and mentioned in particular the additional financial help from the Joint Iron Council, which would enable the John Gardom Student Fund Scheme to continue. The Technical Council were increasingly impressed by the value of the scheme and were very pleased that the name of Gardom would continue to be associated with it.

There was also a close association between the Council and the branches, and Mr. Peace was anxious to record his personal appreciation of the care with which the branches elected their delegates to the Technical Council; in turn, those delegates nominated eight co-opted members. He was proud to be their chairman, and he moved that the report be adopted.

MR. J. MCPHEAT (vice-chairman of the Technical Council), in seconding, endorsed Mr. Peace's remarks, and added a tribute to the work done by the Institute's secretary, Mr. Lambert, the assistant secretary, Mr. Pratt, and the office staff. During the last three or four years particularly the Technical Council had had a mass of work coming from the office; there were from 10 to 20 reports coming in per week.

THE PRESIDENT, in putting the resolution to the meeting, said he would like to couple with the acceptance of it a very sincere vote of thanks to Mr. Arthur Peace and Mr. McPheat for their enthusiasm and their intense activity in pressing forward the work of the Techical Council. Mr.

Part of the assembly attending the annual general meeting of the Institute of British Foundrymen in Cardiff.

Peace had been chairman for many years, and all would agree without hesitation that the success of the Technical Council's activities, which had been recognized throughout the country, was due largely to personal enthusiasm.

(The Report was adopted, and the vote of thanks was accorded with acclamation.)

Awards*

Oliver Stubbs Medal.

THE PRESIDENT announced that on the recommendation of the Institute's Council it had been decided to award the Oliver Stubbs Medal for this year to Mr. John Steele, of the South African branch, in recognition of his valuable services in imparting information to his fellow foundrymen in Great Britain and in South Africa. Mr. Steele, he said, was well known to a number of members. He was brought up in Scotland, and as a member of the Scottish branch he was awarded the McGuinness Shaw Prize. He had had training in Clyde Alloy Steel Company, Limited, and later with G. & J. Weir, Limited. In 1947, he had joined the Iron and Steel Corporation of South Africa and later had specialized in the production of precision castings. He was a past-president of the South African branch and had presented a number of papers at home and abroad. In 1955 he had contributed a paper to the International Foundry Congress in London. The present occasion was the first on which the Oliver Stubbs Medal had been awarded to a member overseas, and all were very glad indeed that the Medal has been so awarded. Unfortunately Mr. Steele could not get to this country to receive it, and the president asked Mr. John Bell to accept it on Mr. Steele's behalf and to arrange for its safe passage to South Africa.

MR. JOHN BELL, as deputy for Mr. Steele, received the Medal very thankfully. He recalled having known Mr. Steele as a young man when he had joined the Clyde Alloy Steel Company, at the age of 16 or 17 years; later, he had won the John Surtees Silver Medal in the Scottish branch. In a recent letter to Mr. Bell, Mr. Steele had written:—"Please convey my best and most sincere appreciation to the Council for this very great honour and tell them that I am proud to be able to bring this award to the country of my adoption. Needless to say, thanks are also due to the Scottish branch for the encouragement I received through the medium of the Surtees examination."

E. J. Fox Medal.

THE PRESIDENT said that the object of this Medal was that the Institute should do honour to outstanding foundrymen anywhere in the world. It was his very great pleasure to announce that the assessors (Sir Frederick Scopes and Dr. J. E. Hurst) had recommended to the Council—and the Council had adopted the recommendation unanimously—that it be awarded to Mr. F. W. E. Spies, of Holland, who was well known in the Institute. He was president of the Netherlands Foundry Association and a past-president of the International Committee of Foundry Technical Associations, and one recalled his outstanding presidency of the International Foundry Congress in Amsterdam in 1949. After the last war, Mr. Spies, perhaps above everybody else, did a tremendous amount of work in re-establishing international co-operation in foundry circles and, at the Jubilee celebrations of the Institute of British Foundrymen in 1954, the members had done him the honour of making him an honorary member.

The president conveyed the apologies of Dr. Hurst that he was unable to be present at Cardiff to award the medal in person, but he was attending at Karlsruhe Technical High School to receive the honorary degree of Doctor of Engineering.

MR. F. W. E. SPIES, on being presented with the Medal, was warmly applauded. He said he was deeply honoured by the decision of the Council of the Institute to accept the recommendation of the assessors that the important award of the E. J. Fox Medal for 1956 be made to him. It was particularly gratifying that he had been deemed worthy of the award because of his work to stimulate co-operation between foundrymen in the international field. At the end of the war, there had been a great need to restore amity and friendship between the people of the world; and in what sphere, he queried, could he have played his part better than amongst his own foundry associates who, perhaps more than other sections of the community, had always been prone to international friendships!

Whilst he was delighted that the small part he had been able to play had received such signal recognition, he emphasized that his efforts had been no greater than those of many of his friends and associates in many countries, not least his British fellow foundrymen, amongst whom had been prominent his old friends Mr. V. C. Faulkner, Dr. A. B. Everest and—never to be forgotten—his great friend, the late Mr. Tom Makemson, and also Mr. V. Delport, who, although he represented American interests on the International Committee, was a member of the Institute and had played a very outstanding part in the work of international co-operation. In thanking the president and the Council of the Institute, and the assessors, for having accorded him a great honour, which he would always treasure and which gave him great personal pleasure and satisfaction, he associated in it all his co-workers in the many countries represented on the International Committee.

Meritorious Services Medal.

THE PRESIDENT had the pleasure to announce that the Council had awarded this Medal to Dr. E. R. Walter, of the Lincolnshire branch. For 25 years he had been secretary, first, of the section and then of the branch; he had been a mainstay of the Institute in Lincolnshire and had brought the membership there up to the strength it had to-day. He had been outstanding also in his services to technical education. Unfortunately, a White Paper was demanding "26 hours a day" from Dr. Walter at the present time, and most reluctantly he had sent an apology that he could not attend the conference. The president therefore presented the Medal to Mr. Bailes to transmit to Dr. Walter.

* See also page 486 of this issue.

IBF Annual General Meeting

MR. J. G. BAILES accepted the Medal with great pleasure and expressed Dr. Walter's appreciation of the honour.

British Foundry Medal and Prize.

MR. C. BARRINGTON HOOPER, C.B.E., presented with great pleasure the British Foundry Medal and Prize of £10 (provided by FOUNDRY TRADE JOURNAL) to Mr. A. Talbot, of the London branch, in recognition of the excellence of his paper on "Cores and Moulds by the CO_2 Process."

John Bell Travelling Scholarship.

THE PRESIDENT announced that this scholarship had been awarded for 1956 to Mr. Ian Earnshaw, of Dumfries.

MR. JOHN BELL explained that unfortunately Mr. Earnshaw was unable to attend the meeting because he was taking his final examination for his B.Sc. and then asked Mr. Daniel Brown, past-president of the Scottish branch, to convey the award to Mr. Earnshaw, with the Institute's best wishes.

MR. BROWN said that, having abandoned all hope himself of ever winning such an award, he would be delighted to hand it to Mr. Earnshaw, whom he knew was extremely grateful. Steps would be taken, he added, to try to bring Mr. Earnshaw into the fold of the Institute.

Diplomas.

THE SECRETARY announced that the Council, at its meeting on June 12, had unanimously resolved, having considered the recommendations from branches, to award Diplomas to the following authors of papers read during the past session:—Mr. J. McGrandle, for his paper on "Scrap Investigation," presented to the Scottish branch; and Mr. J. A. Wilkins, for his paper on "Dust and Fume Extraction in Foundries," presented to the East Midlands branch.

Election of Officers, 1956-57

President.

THE PRESIDENT, with a sense of privilege, proposed the election of Mr. H. J. V. Williams as president for the ensuing year. He said that as one approached Cardiff by road one saw enamelled signs which read, "John Williams & Sons (Cardiff), Limited—seven industries in one." That was the firm from which had come Mr. C. E. Williams, who was president of the Institute at its Cardiff conference in 1933, and from which came also Mr. H. J. V. Williams, who combined not just seven qualities which commended him as president, but many times seven. Mr. Williams had been a member of the Institute since 1933, and for many years had been a member of Council and of its committees. He had been active in the technical committees and was concerned also with education; and he had left his mark in the Cardiff district by the support he had given to the Llandaff Technical College in building up its metallurgical and foundry section.

Mr. Williams was a well known and very popular member of the Institute. He was a good sportsman, a good mixer, a good technical man and had everything needed in a successful president. He had shown, particularly in the last few years, that he had the welfare of the Institute at heart; and the president had not the slightest hesitation in commending him for election.

MR. W. S. GORDON REES (president, Wales & Monmouth branch), as a fellow Welshman, said he had the greatest possible pleasure in seconding the proposal. After Dr. Everest's reference to Mr. Williams' many virtues, one could only add that his election to the presidency would give very great pleasure to his very wide circle of friends and great satisfaction to the whole of the Welsh founding community.

(The proposal was carried with enthusiasm, and Dr. Everest invested Mr. Williams with the presidential chain and badge.)

MR. WILLIAMS thanked Dr. Everest and Mr. Rees for their kind remarks and all the members present for their kindness. He commented that all liked to have nice things said about them, even if they felt it was being "laid on a little bit thick." Seriously, however, he was deeply conscious of the honour, and he made it quite clear that he regarded himself as the servant of the Institute rather than the man who took all the glory. He was very grateful to be elected president; he knew that during his year of office he would have the same assistance as had been given to Dr. Everest; indeed, it would not be possible to do the job without such support.

His first privilege as president was to present to Dr. Everest a past-president's badge as a symbol of the Institute's thanks for the work he had done on its behalf during the past year; and it was a real pleasure to do so.

Group photographs taken at the Cardiff Conference of the Institute of British Foundrymen:

Key: (left to right, where applicable) (1) Mr. H. J. V. Williams, Mrs. Williams, the Lord Mayor of Cardiff (Alderman

(Continued below)

(Continued from above)

D. T. Williams, O.B.E., D.L., J.P.), the Lady Mayoress, Dr. A. B. Everest and Mrs. Everest at the Civic Reception on Tuesday; (2) and (4) Reception committee greeting guests at the same function; (3) Mr. F. W. E. Spies receiving the E. J. Fox Medal from Dr. A. B. Everest at the annual general meeting; (5) (adjoining page) Mr. H. J. V. Williams and Mrs. Williams at the annual dinner on Wednesday; (6) the new president delivering his address and (7) receiving his chain of office from Dr. Everest at the annual general meeting.

IBF Annual General Meeting

DR. EVEREST, in returning thanks, wished Mr. Williams the best of luck and happiness in his office and every success throughout the conference.

THE PRESIDENT then asked Dr. Everest to remain in the Chair for the remainder of the annual general meeting.

Senior Vice-president.

DR. C. J. DADSWELL (past-president) proposed the election of Mr. J. Blakiston, who had served as junior vice-president, to the office of senior vice-president. Mr. Blakiston, he said, was a man of eminence in the industry. He was not only a very experienced engineer and foundryman, and therefore fully qualified to hold office in the Institute, but was particularly distinguished for his professional activities in various parts of the Commonwealth. His achievements and his experience in the technical world would be of great value to the Institute in the conduct of its affairs, and it was a great pleasure to propose his election.

MR. V. C. FAULKNER (past-president), as a fellow Yorkshireman, was particularly pleased to second the proposal. As an example of Mr. Blakiston's enquiring mind, he recalled having visited him some years ago at an up-to-date foundry of which he was manager, when Mr. Blakiston had said there was something wrong. Mr. Faulkner had pointed out that it was a perfectly normal foundry, but Mr. Blakiston's reply was, " Who said that a rectangular foundry was the best possible construction? " In another case, instead of having a mould conveyor, he had emulated the system on the railway platforms of having little motors pulling lines of bogies as a method of transport.

(Mr. Blakiston was duly elected and was invested with the badge of his office.)

In thanking his fellow members for the honour they had done him, MR. BLAKISTON said that in the booklet which was prepared in connection with the Jubilee celebrations of the Institute he had noticed a rather pertinent paragraph which stated that the Institute had never sought a figurehead for the office of president. There was more in that statement than perhaps met the eye. It meant that the president and the senior- and junior vice-presidents were not expected just to grace and adorn the various meetings, but to put in a considerable amount of hard work; he hoped that in occupying one of the senior positions in the Institute he would be able to put in the amount of work expected from him and to justify the confidence placed in him.

Commenting on Dr. Dadswell's reference to his co-operation in various projects in the Commonwealth, he said he was rather proud that he had worked with and introduced foundries and engineering works to every race in the world—black, yellow, brown and white. Thus he had been impressed by the fact that founding was a basic industry and came naturally to mankind wherever he resided or under whatever conditions he was living. The skill seemed to be spread equally all over the world, and the mutual exchange of ideas, fostered by the Institute, would have an important bearing on the future wellbeing of the whole world.

Junior Vice-president.

MR. P. A. RUSSELL, as a representative of the East Midlands branch, took very great personal pleasure in proposing the election of Mr. A. E. Peace to this office. Mr. Peace, he said, was not only a very popular member of the Council, but he had done great work for the Institute. In 1928 he had presented a paper to the Institute's conference at Leicester. Mr. Russell had attended with him the first meeting of the Technical Committee, at Gloucester, and they had both served on it from 1932 onwards. It was now the Technical Council, and Mr. Peace had been its chairman since 1946. He had been awarded the Oliver Stubbs Medal and the E. J. Fox Medal, and in recalling his activities on behalf of the industry one must mention particularly his work for the British Cast Iron Research Association as chairman of its Research Committee. It was a privilege to propose his election to high office.

DR. C. J. DADSWELL (past-president), in seconding, said he also had personal reasons for being associated with the proposal. He had come to know Arthur Peace in the early days of the last war, when they were together on a Ministry of Supply project for a couple of years, and had found him a most wonderful workmate and a very patient and helpful friend. From that time Dr. Dadswell had retained, as had all who knew him, a high regard for him personally; and he needed little introduction in going forward to high office.

MR. PEACE was duly elected and was invested with his badge of office. In acknowledging how gratified he was, he said the Institute had showered honours upon him and he had always accepted them in the past with the greatest pleasure, and he now did so again. It had been very pleasing, he confessed, to hear the nice things that had been said about him by his sponsors; as the President had already said, one liked it, however " thick they laid it on." But he recognized that his job now and in the future called for responsibility and service, and he would do his best to serve the Institute as he had tried to do in the past. However, the services he had been able to give were but little by comparison with what the Institute had given him in education, training, pleasure and good fellowship in the thirty-odd years during which he had been a member. In that connection, too, he referred to the East Midlands branch as comprising a very fine body of people and a branch which really nurtured its members.

Auditors.

On the motion of Mr. J. K. Smithson, seconded by Mr. V. C. Faulkner, the meeting re-appointed Messrs. J. and A. W. Sully & Company, chartered accountants, as auditors for the ensuing year.

Members of Council.

THE SECRETARY read the report of the scrutineers of the ballot papers for the election of five members of Council for the two-year period from June, 1956,

to June, 1958. The following were declared elected:—

Mr. H. G. Hall, Mr. M. M. Hallett, Mr. J. Hird, Mr. R. F. Horton, and Mr. R. L. Handley.

The Retiring President

THE PRESIDENT, proposing the thanks of the Institute to Dr. Everest for his services as president during the past year, said he had known him for nearly as many years as he had been in the foundry industry and had always regarded him as a friend. Their friendship had been close during the past year particularly, during which they had seen so much of each other, and in many ways one was sorry to see him leave the Chair, for he had done such excellent work in the interests of the Institute. His year of office began with the most memorable International Congress in London, and no-one could have graced that office better. Not only had he carried out so well the very heavy duties of his office, but there was also his work with the International Committee, of which he had been a member for so long; he was now vice-chairman of that Committee and would be the president next year.

There was no need to gild the lily; indeed, it was almost impossible to say enough, all present would agree that the presidency of the Institute was held during the past year as well as it had ever been held, and it was a pleasure to thank Dr. Everest for all that he had done.

MR. JOHN BELL welcomed the opportunity to second this proposition. Having himself "walked the presidential road," he knew that the office brought a multitude of duties and that the president became an ambassador at large. Dr. Everest had discharged his duties in such a way that the Institute's prestige was higher now than it had ever been. All who had known him over the years were not surprised that he had done so well, for they had knowledge of his painstaking efforts in overcoming difficulties, and he had fulfilled his duties well in every way.

(The vote of thanks was accorded with enthusiasm.)

DR. EVEREST, expressing his appreciation, said in all seriousness that the moment was a very sad one for him. He had surrendered his chain of office with a great deal of reluctance, for he had enjoyed being president. That was perhaps rather selfish; but the year had seemed very short, and it had certainly been a very happy one. He had had the privilege of visiting the branches during the year and, like all other presidents, he had enjoyed the welcome and the friendship accorded to Mrs. Everest and himself wherever they had been. It was true the year of office as president was exacting; but he emphasized that the path was made very smooth by the high degree of efficiency of the secretariat. It was right and proper that, in accepting the vote of thanks, he should pay tribute to the wonderful support he had had from Mr. Lambert, Mr. Pratt and the office staff in Manchester. It was just one of the many examples of the wonderful way in which the president and all the officers and members were served by the staff; and in that connection he referred also to the organization of the conference programme.

Although he was giving up the office of president, he would not lose contact with official duties, for he looked forward during the next two years to serving and representing the Institute in the international field. That had its own peculiar problems, and he hoped to serve faithfully and well in whatever he could do abroad to raise the prestige of the British foundry industry and of the Institute.

Other Business

MR. J. W. BUTLER suggested that the meeting might wish to express its pleasure in the number of past-presidents who were attending.

THE CHAIRMAN (Dr. Everest) welcomed that suggestion, which was applauded. He also expressed a warm welcome to overseas visitors, who included Mr. Jaeschke, from America, Mr. and Mr. Spies, from Holland, Mr. Le Thomas, from France, and visitors from India and Nigeria.

The meeting agreed that the following telegram be sent to the Swiss Foundrymen's Association, who were celebrating their Silver Jubilee on the following day:—

> "The president, Council and members of the Institute of British Foundrymen, assembled in annual general meeting at Cardiff, send most cordial greetings and congratulations to the Verband Schweizerisch Eisengiesoereien on the attainment of their semi-centenary and warmest good wishes for the next half century."

The following telegram had been received on the previous evening from Switzerland:—

> "As president of the International Committee I wish to convey my sincerest good wishes for your annual meeting. May your Institute continue to flourish and prosper under the leadership of your new president, Mr. Williams. Auf Wiedersehen, In Duesseldorf. (Sgd.) Vuilleumier."

With the approval of the meeting, a telegram was sent to the American Foundrymen's Society, addressed to Mr. Malloney:—

> "The president, Council and members of the Institute of British Foundrymen, assembled in annual general meeting at Cardiff, send most cordial greetings and good wishes to the president, Council and members of the American Foundrymen's Society."

Presidential Address

THE CHAIRMAN, before calling on Mr. Williams to deliver his presidential address, read a telegram just received from his personal staff:—

> "Heartiest congratulations on your appointment to the office of president of the Institute of British Foundrymen. Well done!"

The Chairman's remark that all present would echo those sentiments was applauded.

THE PRESIDENT then presented his address.*

* Printed in last week's issue.

IBF Annual General Meeting

THE CHAIRMAN, proposing a most sincere vote of thanks to the president for his address, said it showed that he was bringing a very thoughtful outlook to the Chair and that he had a deep appreciation of the power and potentialities of the Institute. Dr. Everest had every sympathy with the president's remarks and his motto in the early part of the address; it was right that founders must try to remain human, to keep a balanced outlook on life and at the same time use every means in their power to meet the problems, the technical difficulties, which were inherent in the industry. The president had a kind of approach which appealed to the sympathy of all, and it was a pleasure to thank him for the thoughts he had put forward. One felt that many of them were too deep to be considered and absorbed immediately, and all would look forward to studying the address in print.

MR. J. W. GARDOM (past-president), seconding, said the president had made a plea for giving a little more time to the consideration of the matters referred to in the address, and they were matters for which one never seemed to have time. What appealed to Mr. Gardom was that the president had spared time to get so much into so short a compass, and which he looked forward to studying. On behalf of the meeting he thanked the president very sincerely for an address which all had thoroughly enjoyed.

THE PRESIDENT, in acknowledging the vote of thanks, which was warmly accorded, said he was conscious that he had perhaps wrapped up too much in a small space, and he was glad that it would appear in print.

Edward Williams Lecture

THE PRESIDENT, at this stage, occupied the Chair and introduced to the meeting Mr. W. F. Cartwright, D.L., J.P., M.I.MECH.E., a director and general manager of the Steel Company of Wales, and invited him to present the Edward Williams Lecture. The occasion was particularly pleasing to him in view of his great personal interest in the lecture, for it was a memorial to the presidency of his uncle, Mr. C. E. Williams.

(MR. CARTWRIGHT then presented his lecture.*)

After the lecture, THE PRESIDENT, expressing his personal thanks to Mr. Cartwright, said he was a veritable Daniel in the lions' den.

DR. C. J. DADSWELL (past-president), proposing a vote of thanks on behalf of the meeting, said that when he had heard Mr. Cartwright had accepted the Institute's invitation to deliver the Edward Williams Lecture he had felt that they were particularly fortunate. It had always seemed to him that it needed not only a very competent engineer, but a very able administrator, to be one of the leaders in the conception, the construction and the conduct of what was one of the most modern steelworks in the world. Mr. Cartwright was that man, and he was much admired for his achievements.

Because of the particular background, the origin, of the Edward Williams Lecture, as mentioned by the president, it was also most appropriate that an eminent industrialist in Wales should deliver the Lecture which had its origin in the memory of the last president of the Institute from that region, in 1933. Apart from wanting to be present at the conference to support his friend Mr. Williams, Dr. Dadswell had also determined to be present to hear Mr. Cartwright, remembering the fascinating way in which he had lectured to the Iron and Steel Institute. He assured Mr. Cartwright that the meeting that morning had been absorbed in his lecture. On many occasions eminent scientists—physicists and others—delivered lectures, and sometimes the lectures were perhaps a little above the heads of foundrymen. On that occasion, however, the lecture was right down their street, and they had been absorbed in listening to it.

He had been rather fearful of what Mr. Cartwright might say about steel castings. The meeting were not allowed to enter into any controversy with him, but he would mention one thing in support of what had been said in the lecture—and it was not propaganda—that foundrymen were too ready to accept or put up with designs which it was thought would do the jobs for which they were intended; and the charging box illustrated by Mr. Cartwright was an example of such a case. It was a pleasure to propose a very hearty vote of thanks to Mr. Cartwright for a wonderful lecture.

DR. EVEREST, seconding, said it was very salutary to have the user from time to time telling the foundrymen what he thought about castings. They had heard from Mr. Cartwright a number of home truths, some of which possibly were not too pleasant, as, for example, the changeover to welding. But it had been extremely interesting and valuable to have Mr. Cartwright's opinion about castings, and of the trends under conditions where the castings were subjected to very severe loading. He had talked about some of the most heavily loaded items which any foundry was asked to produce, and he had stressed a matter of very great importance, namely, the need for closer co-operation between user, designer and the foundrymen, so that the foundrymen should know more about the conditions under which castings were to be used.

(The vote of thanks was accorded with enthusiasm.)

MR. CARTWRIGHT expressed his appreciation of the reception accorded him. Speaking of one matter which was cheering to the British steel-foundry industry, he said that a few years ago the machining of big steel castings—housings, and so on—was taking so many hours that it was driving up the costs of British steel-plant equipment. Sometimes 2½ in. had to be machined off, and even more, and he knew of one case where it was 5 in., whereas the Americans had only to machine off ½ in. from similar items. He was told, however, that that situation had now changed, that the tolerance of castings now made by the British iron and steel industry was as close as that in America. That showed a very satisfactory improvement.

* Printed in last week's issue.

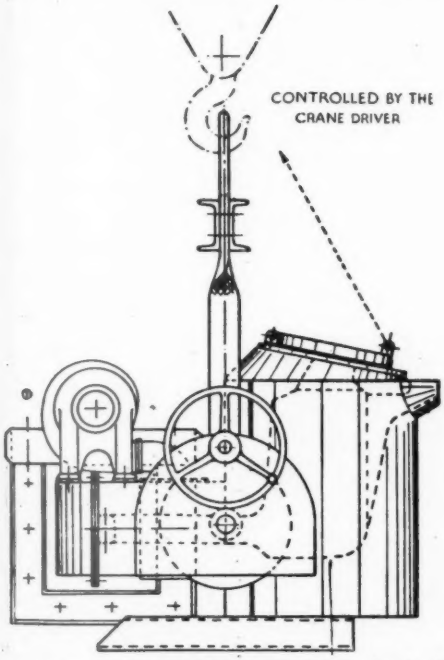
Holding and Superheating in an Electric Ladle*

By E. Calamari

The Author, writing in *Fonderia Italiana*, describes and illustrates a type of ladle for iron or steel that can be heated by electric induction, based on the same principle as mains-frequency electric melting-furnaces, and in which the metal can be maintained at temperature for a long time (practically as long as desired) and if necessary superheated. Such ladle consists essentially of an induction furnace of horizontal-channel type—with air cooling—manœuvrable by means of a crane and equipped with worm and helical pinion for tilting by hand as is shown in Fig. 1. Electric power supply can be provided by a single-phase trolley line, laid along the runways of the ladle.

Scheme of Operation

Thus, the metal delivered from the melting unit (cupola, electric-arc, induction or other furnace) is collected in an electrically preheated ladle and kept



at a readily controllable temperature in the latter throughout the time required for different metallurgical operations to be performed, whether at the tapping temperature or any higher temperature. The metal is then transported to the pouring station where it is either transferred into a smaller pouring ladle or used for filling the moulds directly.

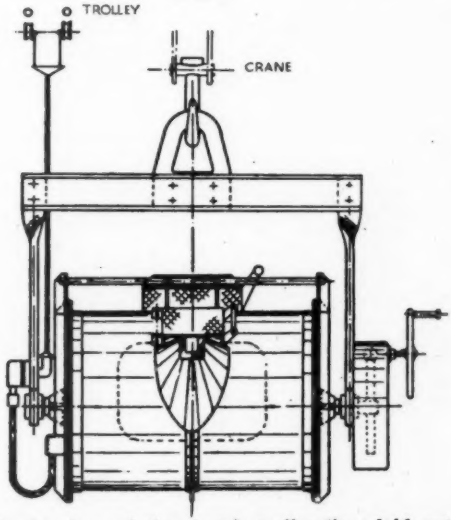
* Translated by the British Steel Castings Research Association.

Fig. 1 shows a ladle equipped with channel-type induction heating and having a vertical crucible, designed to travel on an overhead runway and Fig. 2 shows a drum-type ladle. These ladles have the following characteristics: Power rating 50 kw.; single-phase supply; 220 to 380 v. supply; frequency 50 cycles per sec.; useful capacity 10 cwt.; power consumption required to maintain 10 cwt. of iron at 1,350 deg. C. = 20 to 25 kw.; power consumption required for each 100 deg. C. of superheat 50 to 60 kwh. per ton; maximum temperature 1,550 deg. C. for the type shown in Fig. 1 and 1,750 deg. C. for the type shown in Fig. 2.

These ladles can also be transported on rail track, but this set-up is not so likely to commend itself because of the foundry space taken up by the track and the slowness of such transport. If such transport is used, however, it is more convenient to provide power sockets at the points of use of the

FIG. 1 (*left*).—*Electric ladle, equipped with channel-type induction heating, having a vertical crucible and designed to travel on overhead runway.*

FIG. 2.—*Drum-type, induction-heated, electric ladle.*



ladles in place of the electric trolley lines laid out along overhead runways.

AN EXPLOSIVES expert was killed and two other men were injured on Wednesday in an explosion at the Corby works of Stewarts and Lloyds, Limited. The accident occurred when explosives were being used to break up hardened slag at the bottom of a furnace which is being relined.

IBF Awards 1956

Honours Conferred at the Cardiff Conference

The following medal awards for 1956 were announced at the annual general meeting of the Institute of British Foundrymen, held at the Park Hotel, Park Place, Cardiff, on Wednesday, June 13:—

E. J. Fox Medal

On the recommendation of the assessors, Sir Frederick Scopes and Dr. J. E. Hurst, the Council awarded the E. J. Fox medal for 1956 to MR. F. W. E. SPIES (honorary member) in recognition of the important contribution he has made in promoting co-operation amongst the foundrymen of the world. Mr. Spies, who is president of the Netherlands Foundry Technical Association and a past-president of the International Committee of Foundry Technical Associations, started his industrial career in 1920 as a fuel economy engineer. In 1923, he accepted the position of blast-furnace manager with the Royal Netherlands Blast Furnaces and Steel Works, Limited, at Ymuiden (Netherlands). His present position is general works manager of the Royal Netherlands Blast Furnaces and Steel Works, Limited, the Cemy, Limited, the Breedband, Limited, and the Mekog, Limited, at Ymuiden (Netherlands).

Oliver Stubbs Medal

The Council made the 1956 award of the Oliver Stubbs medal to MR. JOHN STEELE, of the South African branch, in recognition of his valuable services in imparting information to his fellow foundrymen in Great Britain and also, in particular, in South Africa. Mr. Steele, who is a past-president of the South African branch, was born in 1923 at Wishaw, Scotland. He was educated at Wishaw High School and received his technical education at Stow College of Engineering, Glasgow. For the latter course he was awarded the McInnes-Shaw prize. In 1949, he was awarded the Surtees silver medal by the Scottish branch of the Institute, and two years later obtained his intermediate certificate in the City and Guilds examinations. Mr. Steele served his apprenticeship as a moulder with the Clyde Alloy Steel Company, Limited, Motherwell, following which he was employed in the iron and non-ferrous foundries of G. & J. Weir, Limited. In 1949 he became foundry manager of the Precision Casting Department of Rely Products, Limited, Johannesburg. Mr. Steele then held an appointment with Precision Dental Laboratories (Pty.), Limited, Johannesburg, as manager of this company's new precision investment foundry. He is now associated with Foundry Services, Limited. He was awarded a diploma for his paper on "Thermit Casting" published in the 1954 volume of the *Proceedings* of the Institute.

British Foundry Medal and Prize

The 1956 British Foundry Medal and prize of £10 established by the FOUNDRY TRADE JOURNAL which may be given by the Council to the author of the paper adjudged to be the best presented to the Institute during the preceding year, was awarded to MR. A. TALBOT in recognition of the excellence of his paper "Cores and Moulds by the CO_2 Process" which will appear in the volume of the *Proceedings* due for publication. Mr. Talbot was educated at St. Oswald's School and Johnson Technical School, Durham City, and received further technical education at Rutherford College, Newcastle, where he was successful in the City and Guilds examination in foundry practice. In 1923, Mr. Talbot commenced his apprenticeship at the Birtley Iron Company, Limited, and later gained further industrial experience at foundries in the Tyneside, Clydeside, Tees-side, Yorkshire, South Midlands, London and Bristol areas. Returning to London, he was appointed foreman at Western Foundries, of Southall, Middlesex, in 1942, and in 1953, was promoted to his present position of foundry manager with this company. Mr. Talbot, who is senior vice-president of the London branch, joined the Institute in 1937 as a member of the junior section of the Newcastle branch. He has presented papers to several branches, and has held the post of lecturer and instructor to the Education Committees of Middlesex and London County Councils.

Meritorious Services Medal

The Council of the Institute awarded the Meritorious Services medal for 1956 to DR. E. R. WALTER, in recognition of his 25 years' service to the Lincolnshire section and the Lincolnshire branch, and for his work in guiding and developing the branch to its present status. Dr. Walter was educated at London University and served his apprenticeship from 1908 to 1913 at the works of Clayton & Shuttleworth, of Lincoln. From 1913 to 1919, Dr. Walter served as chief draughtsman of the National Projectile Factory at Lenton, Notts, and in the latter year was appointed chief technical engineer of Wadkin Mills, Limited, Nottingham. In 1921 he became a lecturer at Lincoln Technical College, subsequently being appointed head of the engineering department and, later, principal of the College.

Application of Insulated Feeders to Sand Castings in Long-freezing-range Copper Alloys*

By R. S. Jackson, B.Sc., A.R.S.M.

MR. RICHARD S. JACKSON, since July, 1955, has been employed by Deloro Stellite, Limited, as works metallurgist. He was educated at the Sir John Cass Technical Institute and the Royal School of Mines. After graduating as a B.Sc., he joined the staff of the David Brown Foundries Company as a foundry metallurgist, and later held the position of investigator in the castings section of the British Non-Ferrous Metals Research Association, working on the running and feeding of castings and certain aspects of shell moulding.

The Paper describes an experimental investigation into the value of plaster insulating feeder-sleeves and exothermic feeder-sleeves in the production of castings in 85/5/5/5 leaded gunmetal. It is concluded that insulating or exothermic sleeves are unlikely to be advantageous with most small or light-section castings, but that their use may well be economic with large castings where the use of feeders is essential to prevent shrinkage defects. Besides providing information on the immediate object of the research, the work has also thrown much light on the mechanism of feeding in copper alloys having a long freezing-range. It has been shown that during freezing, about half the solidification shrinkage of the alloy investigated is compensated for by "mass feeding" of the plastic mixture of liquid metal and solid crystals. This process occurs whether or not a feeder is attached to the casting but in the absence of a feeder it causes local and/or general sinking of the surface of the casting. The main purpose of feeders attached to castings in these alloys is to pressurize the liquid/solid mass during freezing and hence avoid the formation of noticeable surface sinks. For this reason, feeders attached to castings in these alloys should be relatively tall to give the maximum possible effect. Directional freezing in (unchilled) castings of heavy section is ineffective in promoting soundness.

INTRODUCTION AND SUMMARY

In previous work carried out by the Association on the feeding of copper-base-alloy sand castings,[1, 2] it was shown that large savings in the volume of feeding metal could be effected by the use of insulating and exothermic-sleeves. Moreover, further incidental economies both in reduced fettling costs and the height of the mould could be expected. The previous work was confined to castings in alloys of short freezing-range (aluminium-bronze and high-tensile brass) and it was, therefore, considered desirable to assess the potentialities of these feeder-sleeves when applied to castings made in the long freezing-range copper-base alloys (the bronzes and gunmetals) in which the solidification mechanism is different in character from that of the alloys previously examined.

Feeding Mechanisms

These differences in the mode of feeding have a considerable bearing on the possible advantages to be gained by the use of feeder-sleeves. Castings in the so-called "skin-forming" type of alloy which includes pure metals, eutectics and some alloys of short freezing-range, solidify continuously from the surface towards the heat centre by movement of a narrow front dividing the solid and liquid phases. Here, the action of a feeder-head is simply to provide a reservoir of molten metal above the casting proper to replenish the liquid pool in the centre of the casting and hence to compensate for the volumetric shrinkage on passing from the liquid to the solid state. However, most of the bronzes and gunmetals when sand cast do not freeze in this simple manner but pass through a pasty stage which may cover a temperature interval of several hundred degrees Centigrade. The result is that the initial stages of solidification are often passed in the heat centre of the casting long before the outside can be regarded as fully solid, *i.e.*, solidification proceeds at the same time in all parts of the casting. Thus, any feeding of the casting that may take place will be accomplished by one or both of the following processes:—(1) Mass-feeding, *i.e.*, the movement of the pasty mass under the influence of the atmospheric pressure, gravity and possibly the contraction of the dendrites. The process may sometimes be intermittent and can be responsible for layer porosity. (2) Movement of remaining interstitial liquid (generally enriched in alloying elements and therefore of low-melting-point) under the influence of atmospheric pressure, gravity and capillary attraction between the initially-formed dendrites.

Type of Porosity

Since these agencies are less certain than that operating in the feeding of skin-forming alloys,

* Communication from the British Non-Ferrous Metals Research Association presented last week at the Cardiff conference of the Institute of British Foundrymen. The work described was made available to members of the Association in a confidential report issued in June, 1954.

being affected by the cooling rate, the macrostructure and by the amount of gas liberated on solidification, it is not surprising that castings in this class of alloy show finely-distributed porosity extending more or less throughout the entire section with some concentration in the heat centres. This kind of porosity is difficult to eliminate entirely and provided it is well distributed and is moderate in

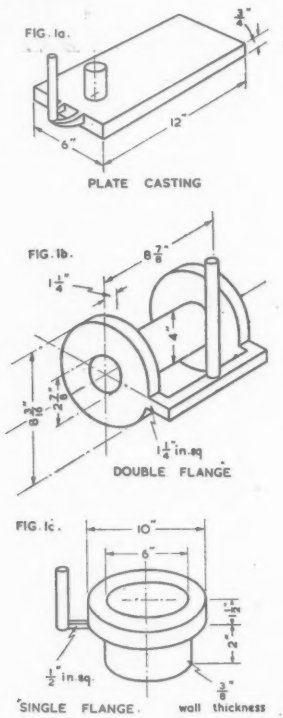


FIG. 1.—*Sketches of castings used in the preliminary work.*

amount, is not unduly harmful. For this reason, many small and medium-size bronze and gunmetal castings are made with a minimum amount of feeding, an enlarged ingate often being the sole source of feed metal; no attempt is made completely to prevent shrinkage porosity and the foundryman seeks only to avoid the presence of harmful local concentrations. The fact that it is possible to make serviceable castings without elaborate feeding arrangements results in important economies which include high casting yield, simplicity of pattern equipment and low fettling cost. It is obvious therefore that a very strong case must be made for the use of feeders on small castings before any change in the conventional techniques can be recommended.

The advantages of using feeder-sleeves with castings of this kind are therefore uncertain, although the following are possible:—(1) Increased soundness resulting in improved pressure tightness, mechanical properties and corrosion resistance, and (2) greater dimensional accuracy, especially on the upper surfaces of castings, due to the elimination of the " sinks " which tend to develop as a result of mass feeding.

Large bronze and gunmetal castings are normally fed by substantial feeders, usually because " sinks " or " draws " are otherwise encountered, and here the use of feeder-sleeves might be expected to permit reduction in the size of the heads. For these reasons and because plaster and exothermic-sleeves are in any case unlikely to be of value with small castings,[1, 2] the present investigation was restricted to the study of the feeding of castings containing medium and heavy sections.

Summary of Results

A widely-used long-freezing-range alloy was chosen for the experimental work, namely 85/5/5/5 leaded-gunmetal (B.S.1400 L.G.2). The fact that this is an excellent casting alloy made the choice of a suitable casting shape difficult. Designs tested included a flat plate, a double- and single-flanged pipe coupling and a cylinder. Application of feeders to the first casting proved to be of limited benefit, both this and the following two castings proving to be commercially sound without feeding, and the cylinder gave very scattered results. Finally, a rectangular block was found suitable for the bulk of the work as this made some assessment of the volume of surface sink possible.

It was found that unfed sand castings in 85/5/5/5 leaded-gunmetal do not normally contain large amounts of porosity provided gas absorption by the metal is avoided. Instead, the bulk of the solidification shrinkage was compensated for by collapse of the skin. This collapse was more or less uniform over the entire surface of castings of thin and medium section and was not therefore readily apparent. It is concluded that the provision of special feeding arrangements is unnecessary with these castings, except when high dimensional accuracy is of particular importance.

In the heavy section castings, the collapsing of the surface was more localized, forming visible " sinks " in the surface. However, the use of small feeders, insufficient in themselves to give directional solidification,† eliminated any visible sinking and slightly increased the density of the castings. Feeders of about twice the minimum to promote directional solidification were needed completely to prevent any collapsing of the casting but their use was accompanied by an increase in the general porosity, presumably as the result of the slower rate of freezing.

Within certain limits, the general volumetric-contraction of the casting decreased linearly with an increase in the height of feeder of constant dia-

† Here and elsewhere the term " directional solidification " is used to describe the case where complete solidification of the casting precedes complete solidification of the feeder; in long-freezing-range alloys this condition does not ensure that the casting is completely fed at the expense of the feeder.

meter. Although for most purposes, a feeder of height 1.5 times the dia. is likely to be adequate, feeders which are proportionately higher might be considered in cases where dimensional tolerances are of special importance.

Feeders necessary to prevent visible sinking of the surface of castings of heavy sections are smaller than those needed to prevent shrinkage cavities in a similar casting made in a skin-forming alloy since directional solidification is not essential in the former case. However, the present results show that similar economies in feeder size can be made by the substitution of blind plaster of exothermic-sleeves for the open sand feeders. Bronzes tend to absorb gas from the latter kind of sleeve and this may be a drawback to their use.

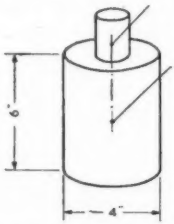


FIG. 2.—*Cylindrical test-casting used as representative of heavy-section work.*

EXPERIMENTAL TECHNIQUE AND PRELIMINARY WORK

Technique

Melts of 85/5/5/5 (B.S. 1400 L.G.2) leaded-gunmetal were produced from virgin metals and after making the alloying additions were degassed with nitrogen, at a rate of 5 litres per min. for 10 min. The melts were deoxidized before pouring by an addition of 0.02 per cent. phosphorus and poured at approximately 1,130 deg. C.

The dry-sand moulds were produced from Erith No. 1 silica sand containing 5 per cent. bentonite. The surfaces were sprayed with a dressing of aluminium-10 per cent. magnesium-alloy paint to inhibit metal/mould reaction which might otherwise invalidate the results by causing gas porosity in the castings.

The plaster feeder-sleeves used in this work were made from foamed plaster using the technique described elsewhere;[2] the exothermic-sleeves were rammed up from a proprietary material.

Measurements were made of the temperature at (*a*) the heat centres of the castings and (*b*) about 1 in. inside the feeder, by means of 28 a.w.g. chromel/alumel thermocouples situated at these points. The temperatures were recorded with the apparatus described elsewhere.[2] These measurements indicated the progress of solidification of (*a*) the castings, and (*b*) the feeder.

Both the direction of freezing and the rates of solidification of the feeders and the casting were ascertained from the cooling curves thus obtained. It was found that the primary arrest varied as much as 20 deg. C. between castings so that an arbitrary solidification interval of 1,000 to 800 deg. C. was assumed. These records were also a check on the pouring temperature of the metal.

After cleaning and removal of the runner and feeder exactly flush with the casting surface, visual examination for tears and sinks was carried out. The volume and density of the block were then determined by displacement methods.

Selection of Test Casting

In selecting a suitable design for the test casting, it was desirable to adopt a shape representative of an industrial casting and also one from which the results would be comparable with those already obtained for skin-forming alloys. The first casting studied was a horizontal plate casting 12 by 6 by ¾ in. run through two small closely spaced ingates at one end (Fig. 1a).

With no feeding except that drawn in through the small runners and gates, densities of 8.71 and plaster-sleeved feeder placed in close proximity to 8.78 gm. per cc. (2.7 and 1.9 per cent. porosity) were obtained whereas with a 2-in. dia. by 3-in. high the ingates, the densities were increased to 8.86 and 8.87 gm. per cc. (1.0 and 0.9 per cent. porosity). This improvement in the overall soundness of the plate is quite marked, bearing in mind that very steep temperature-gradients are known to be required to ensure good feeding of such long-freezing-range alloys. However, the runner and ingates were small and it is likely that a somewhat larger runner and correspondingly larger gates would have yielded plates nearly as sound as that made with the plaster-sleeved feeder. Moreover, in the Association's experience, serviceable industrial bronze and gunmetal castings commonly gave over-

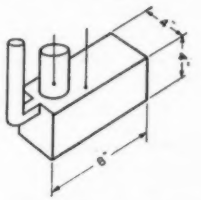


FIG. 3.—*Rectangular block test-casting used for the bulk of the experiments.*

all porosities of the order of 2 per cent. or more and this being so, it is unlikely that the cost of special feeding arrangements such as insulated or exothermic feeder-sleeves, could be justified for castings of this (¾ in.) or thinner section.

The second design was a double-flanged pipe coupling used by other workers in pressure-tightness experiments[3] (Fig. 1b). Although facilities were not available to test the specimen to destruction, a casting made to this design with very little feeding through the running system, gave a density of 8.61 gm. per cc. (3.8 per cent. porosity) and was pressure tight to air at 90 lb. per sq. in. The next casting tried was a heavy circular flange 10-in. o.d., 6-in.

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i.d. and 1½-in. wide connected at the bore to a tube of ⅜-in. wall-thickness and 2 in. in length (Fig. 1c). This proved similarly unpromising giving a density of 8.74 gm. per cc. (2.3 per cent. porosity) when made without feeders and showing no draws at the severe change in casting thickness. Slight porosity was present near the ingate but this would no doubt be eliminated by a small enlargement of the runner.

It was then decided to examine the feeding of a block casting representative of castings containing heavy sections for which, in industry, feeding arrangements are normally made. The first of these, illustrated in Fig. 2, was a cylinder 4-in. dia. by 6-in. high surmounted by the appropriate size of cylindrical plaster-sleeved feeder, the height being

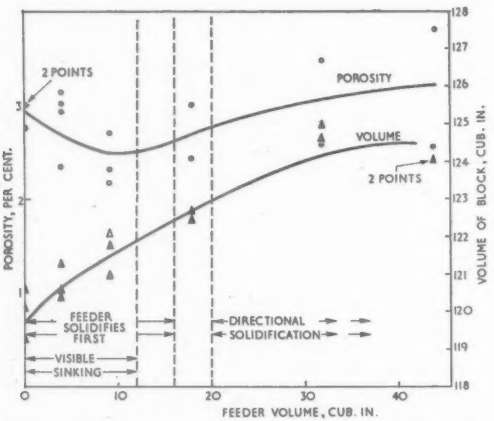

FIG. 4.—*Graphs of volume and porosity of 4 by 4 by 8-in. block casting according to feeder size for plaster- and exothermic-sleeved feeders.*

Key: Plaster-sleeved feeder, ● porosity and ▲ volume exothermic-sleeved feeder, O porosity and Δ volume.

equal to 1.5 times its diameter[4]. This casting is similar to that previously used for examination of the feeding of skin-forming alloys[2] except that in the present work it was axially top-poured through a heated tundish with a ¼-in. dia. orifice thus maintaining a controlled rate of pour, to produce an initially favourable temperature-gradient in the casting, and avoiding metal impingement on the sleeve. As soon as the feeder was filled to the brim, a foamed-plaster cap was placed on top to give the cooling conditions of a blind feeder. Since the density results, recorded in the next section, showed an extraordinary degree of scatter partly due to the irregular sinking of part of the surface, this shape of casting was also abandoned.

The final design used for the bulk of the experimental work and illustrated in Fig. 3 was a 4 by 4 by 8 in. horizontal block, in which it was hoped that sinking of the skin would be confined to the upper surface where its extent could be estimated. Running was accomplished through a ½-in. square runner on the upper edge with a blind foamed plaster or other feeder on the upper surface close to the ingate so that hot metal would enter it only after filling the mould cavity (see Fig. 3). This design was used both with a series of feeders of varying sizes whose height was 1.5 times the diameter and also for a second series of feeders of constant diameter but differing heights.

RESULTS

Cylindrical Casting

After removal of the feeders, the densities of the cylinders were determined and the porosities calculated on the assumption of a maximum density of 8.95 gm. per cc. The results, in order of volume of the feeders are recorded in Table I.

The degree of scatter is considerable and statistical analysis of the results shows no significant correlation between the size of feeder and the porosity. It was evident that factors other than feeder size were of great importance in determining the density. Other possible causes of the scatter include slight gas evolution, variations in the rate of cooling[6] and the metallurgical structure.[7] It seems likely that the main one was that of the sinking of the casting surface.

TABLE I.—*Density Measurements of Cylinder Castings made with Plaster-sleeved Feeders.*

Casting No.	Feeder. Size in.	Feeder. Volume in.	Density of casting gm. per cc.	Porosity of casting* per cent.	Relative Order of freezing of casting and feeder.
78	0	0	8.72	2.6	—
85	0	0	8.74	2.4	—
76	1½ × 2½	3.97	8.72	2.6	Feeder first
81	1½ × 2½	3.97	8.72	2.5	,, ,,
75	2 × 3	9.2	8.61	3.8	Simultaneous
82	2 × 3	9.2	8.82	1.4	,,
83	2½ × 3⅜	13.4	8.84	1.3	Directional
86	2½ × 3⅜	13.4	8.76	2.1	,,
77	2½ × 3½	18.0	8.64	3.4	Directional
79	2½ × 3½	18.0	8.66	3.3	,,
84	2½ × 3½	18.0	8.87	0.9	,,

* Calculated on basis of theoretical density of 8.9 gm. per cc.

It was not possible to make any reliable estimate of the extent of this sinking because much of it took place at the base of the feeder thus preventing removal of the feeder flush with the top of the casting. Attention was therefore transferred to the rectangular block casting.

Rectangular Block

(*a*) *Effect of Feeder Size.*

As with the cylindrical casting, the feeder size was varied, using a feeder height to diameter ratio of 1.5 to 1. The blocks produced generally showed sinks only in the upper surface, but when this sinking was very severe, as in the case of the blocks cast without feeders, sinks and hot-tears occurred on the long sides as well.

There were several instances of slight scabbing below the ingate due to the impingement of the metal on entering the mould but no changes in running technique were made as the defect was of little consequence and as it was desired to fill the feeder with the hottest metal.

The density measurements and the volumes of the blocks after the removal of runners and feeders are shown in Table II. As well as those made with blind plaster-sleeved feeders, these include two with blind sand-feeders, and two with blind exothermic-sleeves. Results obtained from three unfed blocks containing gas porosity are also given; the first of these was allowed to pick up gas from the mould by means of metal/mould reaction while in the second and third, the metal was deliberately gassed before pouring, by passing hydrogen into the melt for five minutes.

Graphs of the volume and porosity of the castings against feeder size are shown in Fig. 4 for castings made with plaster- and exothermic-sleeve feeders; it is apparent that there is still considerable scatter present but this is hardly surprising in view of the number of incidental factors involved. The effect of increasing feeder size on the porosity is first to bring about a slight reduction followed by a general increase, the minimum porosity corresponding to a feeder inadequate in size to promote directional solidification towards the feeder. The effect of feeder size on the volume of the resulting block is to give a steady increase up to a feeder size about twice that required to promote directional solidification; the total volumetric increase as compared with an unfed block is of the order of 3 to 4 per cent. Although this increase in volume is continuous it is interesting to note that the disappearance of obvious visible curvature on the top face corresponds to the minimum on the porosity curve; the remaining increase in volume was only detected by careful measurement.

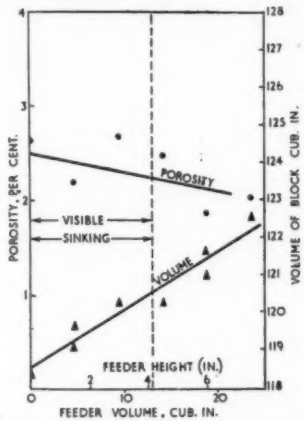

FIG. 5.—*Graph of volume and density of 4 by 4 by 8-in. block according to volume for blind, foamed-plaster-sleeved feeder.* Key: ● Plaster-sleeved feeder (porosity); ▲ plaster-sleeved feeder (volume).

Although a blind, foamed-plaster sleeve of 2½-in. dia. by 3¾-in. high was sufficient to bring about simultaneous solidification of the block and the feeder, it will be seen that it was necessary to employ a 4-in. dia. by 6-in. high blind sand-feeder to achieve similar results. This represents a saving of

TABLE II.—*Porosity and Volume of Block Castings.*

Casting No.	Feeder* Size, in.	Feeder* Volume, cub. in.	Feeder type and condition of metal.	Density of block, gm. per cc.	Porosity of block, per cent.†	Contraction of block,‡ cub. in.	Relative order of freezing of casting and feeder.
88	0	0	—	8.68	3.0	4.4	—
91	0	0	—	8.70	2.8	5.7	—
95	0	0	—	8.68	3.0	4.9	—
98	1½ × 2½	3.97	Foamed plaster	8.74	2.4	4.5	Feeder first.
99	1½ × 2½	3.97	,, ,, ...	8.68	3.0	3.7	,, ,,
100	1½ × 2½	3.97	,, ,, ...	8.69	2.9	4.3	,, ,,
94	2 × 3	9.2	Foamed plaster	8.74	2.3	4.0	Feeder first.
96	2 × 3	9.2	,, ,, ...	8.77	2.7	3.2	,, ,,
93	2½ × 3¾	18.0	Foamed plaster	8.73	2.4	2.3	Simultaneous.
97	2½ × 3¾	18.0	,, ,, ...	8.68	3.0	2.5	,,
90	3 × 4½	31.8	Foamed plaster	8.64	3.5	0	Directional.
92	3 × 4½	31.8	,, ,, ...	8.72	2.6	0.4	,,
102	3½ × 4⅞	43.7	Foamed plaster	8.61	3.8	0.9	Directional.
103	3½ × 4⅞	43.7	,, ,, ...	8.72	2.6	0.9	,,
108	4 × 6	72.8	Sand feeder	8.74	2.3	2.9	Simultaneous.
109	4 × 4 × 8	128	Sand rectangular	8.54	4.6	—	Directional.
107	1½ × 2½	3.97	Exothermic	8.67	3.1	—	—
106	2 × 3	9.2	,, ...	8.76	2.2	2.9	—
101	0	0	Mould reaction	8.27	7.6	5.1	—
104	0	0	Gassed metal	8.08	9.7	1.2	—
105	0	0	,, ,, ...	7.81	12.7	0.3	—

* Feeders were cylindrical except in the case of casting No. 109 when a rectangular one was used.
† Calculated on a basis of a theoretical density of 8.95 gm. per cc.
‡ A maximum volume of 125.0 in. has been assumed, and the figures quoted are the difference between this figure and the measured volume of the castings

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over 80 per cent. in the volume of feeding metal and is comparable with that achieved with skin-forming alloys previously.[1, 2] Even with the smaller of the two blind exothermic-sleeves, sufficient mass-feeding was achieved to avoid curvature of the casting surface, but in both cases gassing of the feeding metal took place. The resulting porosity extended just below the casting surface.

Of the three unfed blocks containing gas porosity the two in which the gas was present in the metal before pouring, showed no signs of collapse while that in which the gas was produced by reaction with the mould surface showed slight sinking of the upper surface. In view of the high porosities of all these castings, it appears that the deliberate introduction of gas is not a satisfactory way of avoiding surface sinking in heavy castings in this alloy.

TABLE III.—*Influence of Feeder Height on Porosity and Volume of Block Casting. (Blind Foamed-plaster-sleeved Feeder of 2-in. dia.)*

Casting No.	Feeder height in.	Density of block gm. per cc.	Porosity of block per cent.*	Contraction of block cub. in†
118	0	8.71	2.6	5.8
112	1½	8.75	2.2	4.3
116	1½	8.78	1.9	4.9
113	3	8.71	2.7	3.7
114	4½	8.73	2.5	3.7
115	6	—	—	2.7
117	6	8.77	2.1	2.9
119	7½	8.77	2.0	1.4

* Calculated on a basis of a theoretical density of 8.95 gm. per cc.
† A maximum volume of 124 in.³ has been assumed, and the figures quoted are the differences between this figure and the measured volume of the casting. Although using the same 4 by 4 by 8-in. block as previously some pattern shrinkage had taken place between the dates of the two series of tests so that a smaller maximum volume has been used.

The results are recorded in Table III, and illustrated graphically in Fig. 5, the volume and density of the block being plotted against feeder volume to correspond with Fig. 4.

(*b*) *Effect of Feeder Height.*

In view of the strong evidence presented above, that in these alloys the principal action of the feeder is to pressurize the casting during the mass-feeding stage, a supplementary series of tests was made in which plaster-sleeved feeders of different heights but the same diameter were attached to the rectangular block casting. It was expected that although hydrostatic pressure exerted by these feeders would vary with their height, the thermal effects of the different members of the series would all be about the same* and it was thus hoped to separate the thermal and pressurizing effects of the feeders in these experiments. The feeder diameter selected was 2 in. corresponding to the minimum on the porosity curve in Fig. 4, and the height was varied from zero to 7½ in.

It will be seen that the density is only slightly increased by feeder heights but the relationship with the volume of the casting is fairly marked and linear over the range examined. Obviously, there is a limit to the extent of this increase in volume of the resulting casting, the upper limit corresponding to the actual volume of the mould cavity.

* Application of Chvorinov's Rule[13], which states that the freezing time of a mass of metal in a mould is proportional to the ratio (volume of mass)²/(surface area of mass)², shows that cylindrical sections of equal diameter but differing heights should have equal freezing times, provided the end effects can be neglected.

COMMENTS

The 85/5/5/5 gunmetal used in the present tests is fairly typical of the long-freezing-range copper-base casting alloys. These alloys solidify in sand moulds in a pasty fashion and their freezing shrinkage is compensated by two quite distinct modes of feeding.[8]

The first, a general consolidation of the pasty mixture of primary copper-rich crystals and residual liquid, under the influence of hydrostatic and atmospheric pressure, is termed mass-feeding and it probably persists until at least 60 per cent. of the metal has solidified.[9, 10] Such feeding will occur whether the casting is "fed" or not and provided the gas content of the metal is low, this mode of feeding may be expected to compensate for at least 60 per cent. of the total freezing shrinkage. Reported values for this shrinkage are of the order of 6 per cent. by volume[11] and accordingly it is to be expected that any sand casting in such (substantially gas-free) alloys will not contain more than about 3 per cent. porosity. The present results are consistent with this view. For example, the block castings contained porosity of the order 2½ to 3 per cent. even when the casting solidified before the feeder, and with these large sections the only notable effect of the feeders was to eliminate surface sinks from the casting and, as it were, transfer this manifestation of mass-feeding to the surfaces of the feeders. Insulated feeders evidently achieve this desirable end much more efficiently than feeders moulded in sand. If the view is correct that the efficiency of this kind of feeding is largely dependent on the hydrostatic pressure exerted by the feeder, an increase in feeder height should result in improved feeding. The experiments illustrated in Fig. 5 indicate that this is so and thus confirm the suggested mechanism of feeding.

The second mode of feeding operates after mass-feeding ceases, and consists of an influx of residual liquid into the casting through the network of channels between the now coherent primary crystals. However, unlike mass-feeding, the extent of such feeding depends on the temperature gradients through the solidifying mass and any useful degree of feeding of this kind requires the existence, between feeder and casting of very steep temperature gradients.[12] The present results show that with heavy-section sand castings, *e.g.*, the cylinder and block castings, the provision of feeder heads (insulated or otherwise) which freeze after the casting, does not materially improve feeding of this kind, indeed there are indications that large or equivalent insulated feeders may increase the porosity in the casting, probably because they reduce its rate of solidification and flatten rather than steepen the temperature gradients from casting to feeder. In thinner-section castings, of which the ¾-in. thick plate is an example, the use of suitably dimensioned runners and gates or feeders can evidently promote a good deal of interdendritic feeding, for, with suitable conditions the porosity in the casting can be reduced to only about 1 per cent.

CONCLUSIONS

To conclude, it seems likely that insulated or exothermic feeding-devices are unlikely to offer advantages in the case of small- or light-section castings, but that for large bronze and gunmetal castings where feeding provision is essential to eliminate surface sinks, these devices are likely to be very useful. The results show that a sand-moulded feeder suffices which is less than half the volume of the feeder which would be necessary if the castings were made in a skin-forming alloy. Even so, a fairly-large normal-sand feeder would be required with heavy castings and use of feeders sleeves with plaster or exothermic material should result in worthwhile economies. The results in Table II suggest that the size of blind sleeved feeders required to replace a normal open-sand feeder can be approximately calculated from the information given earlier[2] for castings in skin-forming alloys. This earlier work showed that use of blind plaster—and exothermic—sleeves enables the feeder volume to be reduced by about 6 to 7 and 6 to 10 times respectively by comparison with a normal open sand-moulded feeder. This present work indicated that a reduction of about 5 times is possible with castings in long-freezing-range alloys. Except in very large castings which may take hours to solidify and where exothermic-sleeves would be unsuitable, these sleeves should be more effective than a plaster-sleeve of similar size, since the effect of the feeder is required early in solidification when mass-feeding is taking place.* A possible drawback to the use of exothermic-sleeves is the danger of gassing the metal.

Acknowledgment

The Author is indebted to the director and Council of the British Non-Ferrous Metals Research Association for permission to publish this Paper.

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* Mass-feeding largely occurs in the first 100 deg. C. of the freezing range of 200 deg. C. or more.

Machine Tool Imports

When the Finance Bill was considered in committee in the House of Commons last week, Mr. Charles Hobson (Lab.) moved an amendment to retain the investment allowances for the machine-tool industry.

He said that although the industry was not, like the cotton industry, faced with falling orders, it was vital to the nation's economy as the prime mover of the engineering industry. At a time when there was increasingly keen competition from its counterparts in the United States, Switzerland, and Western Germany, it was essential that this industry should continue to derive the benefit of the allowances.

Another Labour Member, Mr. Austen Albu, said that as the basic industry for every manufacturing industry here its expansion was quite inadequate. In the first two months of this year imports of machine tools exceeded exports. The situation in the past year had been that capital goods, and, of course, steel as well, had been imported in order to make consumer goods. If this was not lunacy he did not know what was.

Sir Edward Boyle, Economic Secretary to the Treasury, said the increase in the importation of machine tools in the first few months of this year was disturbing, but investment in the steel industry would, he believed, be increased by £63,000,000 this year. Dollar imports of machine tools were still pretty rigidly controlled. A strong case could be made out for this amendment and the Chancellor had considered it carefully. He had come to the conclusion that there was a very special case for giving exceptional treatment to shipping, scientific research, and fuel saving, but he had decided he could not this year go beyond these three categories.

Voting on the amendment gave the Government a majority of 50.

Pneumoconiosis Pensions

Disablement pensions in payment on October 31, 1954, in respect of pneumoconiosis are estimated at 28,000 out of a total of 121,000 in the fifth interim report of the Government Actuary, Sir George Maddex, on the National Insurance (Industrial Industries) Act, 1946. The number of pneumoconiosis pensions awarded in the preceding 12 months was nearly 7,000, compared with an annual average of little more than 4,000 in earlier years.

"This sharp increase is primarily due to the fact that since January, 1954, disablement benefit in respect of this disease has been payable for all degrees of disability however small," says the report. "Before that date, disability assessed at less than 5 per cent. was excluded. As a result of this extension of title to benefit, over 2,000 persons became immediately eligible for a pension on January 11, 1954."

The number of pension awards during the year ended October 31, 1954, in respect of accidents and diseases other than pneumoconiosis was nearly 45,000, which compares closely with the average for the five years 1949 to 1953.

There was an average of 21,000,000 persons insured for industrial injury benefits during 1954 and of these about one third were women. Total income of the Industrial Injuries Fund for 1954-55 was £44,300,000, compared with £44,200,000 in the previous year. Expenditure increased from £29,000,000 to £30,000,000, leaving a balance of £14,300,000 to be added to the fund, which at March 31, 1955, amounted to £123,100,000. Commenting that his balance may seem a large sum, the report points out that a very much larger balance will be needed to maintain financial equilibrium.

Portable Mould Dryers

A Report on "Drying of Moulds by Portable Dryers" has been issued by the technical sub-committee of the Joint Standing Committee on Conditions in Ironfoundries, and is published by HM Stationery Office, York House, Kingsway, London, W.C.2. The committee, presided over by Mr. Colin Gresty, endorsed the recommendations of the Joint Advisory Committee that mould dryers were preferable to open-fires for mould drying.

Recommendations

The following 31 recommendations are printed in the Report, which carries 17 appendices.

1. No ordinary open-fire should be used for mould drying other than in exceptional cases where it can be shown to be unavoidable.
2. Hard cupola coke is the most suitable fuel whilst hard furnace coke is also suitable. Gas coke is less satisfactory.
3. The coke should be graded and the size should not be less than 1½ in. The size range from 2 to 3 in., when free from fines, gives the best results.
4. Gas coke in the size range less than 1 in. is definitely unsuitable and should not be used.
5. Manufacturers of mould dryers should ensure that the depth of the fuel bed is not such as to produce excessive carbon monoxide in the products of combustion.
6. Coke should be charged frequently and in small quantities, or alternatively a controlled-feeding device should be employed.
7. Manufacturers should ensure that the fan will overcome the resistance of the dryer and the mould.
8. The fan should supply a sufficient volume of air to the dryer.
9. Valves should be simple in operation.
10. Valves should be designed so that they remain operative in spite of dirt and rough handling.
11. Where separate valves control the primary and secondary air it should not be possible to shut off the secondary air completely.
12. The grate should be designed to allow of easy clinkering and cleaning.
13. The grate of the dryer should be kept clean and clinker or ash should not be allowed to accumulate on it.
14. Mould dryers should be used in such a fashion that there is as little restriction as possible between the dryer outlet and the mould outlet.
15. The end of the main discharge pipe from the dryer should be not less than 1½ times the pipe diameter from the nearest protection plate or mould surface.
16. The total area of the discharge openings from the mould should be not less than 1½ times the area of the dryer discharge pipe. If this cannot be ensured by the use of the runners and risers, or by wedging up the cope, then a "lift out" piece should be provided to give the required area.
17. The cross-sectional area of any ducting between the dryer and the mould should be not less than the cross-sectional area of the dryer outlet.
18. If bends are included in any ducting between dryer and mould, they should be of the full duct diameter and round rather than abrupt; it should not be forgotten that a right-angle bend reduces the effective cross-sectional area of the pipe to seven-tenths its original area, so that pipe diameters should be correspondingly increased as the angle between the arms of the bend decreases.
19. A $CO:CO_2$ ratio of not more than 0.05 should be obtained within 5 minutes of recharging the dryer with cold coke.
20. A $CO:CO_2$ ratio of not more than 0.02 should be obtained within 10 minutes of recharging the dryer with cold coke.
21. These ratios should be obtained when the dryer is working at the makers' stated rate, and discharging against a back pressure of 1-in. w.g. in the discharge pipe.
22. Low-sulphur coke should be used to minimize the production of sulphur dioxide.
23. When controlling the temperature of the exit gases by adjusting the valves, the combustion rate should be high enough to maintain a brightly incandescent fuel bed.
24. The mechanical design should be simple, so that even after much use or neglect, the dryer will function correctly.
25. The dryer should be designed so that it can be lifted in safety.
26. Initial lighting of the dryer should be safe and simple.
27. Wherever possible an initial charge of brightly burning coke should be used to avoid smoke, and the fuel bed should be built up gradually to the recommended height.
28. Wide fluctuations in the proportions of fuel and air should be avoided.
29. Mould dryers should not be used in confined, unventilated spaces.
30. When the discharging gases from a mould escape through a single opening it is probably worth while fitting a short pipe to the opening so that the gas discharge will be above breathing level.
31. Manufacturers should issue clear and simple instructions on the use of dryers and these instructions should be readily available to operators. This might be achieved by affixing instruction plates to all dryers. Strict compliance should be maintained with the makers' instructions when using dryers.

Students' National Service

When asked by Mr. Frederick Willey (Lab.) last week, whether he would consult with representatives of the universities and technical colleges and of industry regarding the effect upon the recruitment of students of the granting of deferment of National Service to certain categories of graduates and those holding equivalent qualifications, the Minister of Labour pointed out that deferment was not granted to any category of graduates as such, but deferments were granted to certain individual science and engineering graduates who were engaged in work of particular national importance. He had received no representations as to the effect of deferment of this kind on the recruitment of students to universities and technical colleges.

The Minister said the number of deferments this year was expected to be about 1,400, and it was a graph that had been climbing very steeply indeed over the last two years.

ACCORDING to figures published by the Ministry of Labour, unemployment in the UK fell by 14,084 between April 16 and May 14, when the total was 237,431, including 29,528 temporarily stopped.

The number of vacant jobs fell by 10,000 to 380,000 between April 4 and May 2, and compared with 425,000 on May 4 last year.

Institute of British Foundrymen

TECHNICAL COUNCIL

Twenty-fourth Annual Report, to April 30, 1956.*

During the past year the advisory panel to the chairman of the Technical Council has again reviewed suggestions for further work which have been submitted from time to time by branches and individual members. As a result two new sub-committees—T.S.51 on Terms and Definitions for the Ironfoundry Industry and a joint committee with the BCIRA to consider recommendations for the revision of B.S.991, Data on Cast Iron—have been appointed. Other new sub-committees are contemplated and will be appointed as soon as possible. Of those who have been good enough to submit suggestions for further work, many will note that their advice has been taken and all will understand that it was duly considered and appreciated.

Three sub-committees have brought their work to fruition during the year and two will present reports for discussion at the annual conference at Cardiff in June. The work of the other sub-committee, which was concerned with the non-ferrous section of the "Atlas of Typical Microstructures," has been passed to the committee which is co-ordinating all parts of the Atlas with a view to early publication. One sub-committee (T.S.38—Copper-base Alloy Castings) having completed all the work which it is considered can usefully be done at present, has been dissolved.

Perusal of this report, although only an unpretentious outline touching here and there on the vast amount of work embodied in the activities of the technical committees, cannot fail to bring a realization that the industry would pass into a period of noticeable technical dearth were it necessary to lay the many investigations aside for lack of funds. The Technical Council therefore warmly associates itself with the General Council's expression of gratitude for the renewal of the Joint Iron Council grant. The Technical Council also values greatly the further help which the Joint Iron Council has given to maintain in being the former John Gardom Student Fund Scheme, to which considerable importance is attached as a useful means of developing promising young foundrymen. It will henceforward be known as the Joint Iron Council Gardom Student Fund Scheme.

Important help which must be acknowledged has also been received from other sources. To the Universities of Durham and Birmingham the Institute's thanks are due for continuing to help in various items of research work, while the many firms who have again allowed their employees to staff the technical committees and permit experimental work to be carried out in their foundries and laboratories, must be accorded the appreciation due to major collaborators in this record of technical study. Not the least important part, of course, has been played by the large number of members who served on the sub-committees, and of these a special tribute must be paid to the respective chairmen whose onerous task it is to inspire the enthusiasm which often brings solutions in the most unpromising circumstances.

The Institute has continued to enjoy the co-operation of the Institution of Mechanical Engineers and the Institution of Production Engineers in the work of the technical sub-committee concerned with the effect of casting design, while the British Cast Iron Research Association, the British Steel Castings Research Association, the British Non-Ferrous Metals Research Association, the Light Metal Founders' Association, the Association of Bronze and Brass Founders and the Bronze and Brass Ingot Manufacturers' Association have maintained their collaboration with the work of the many committees concerned with their respective fields.

On the other hand, the Institute has continued its contributions during the past year to the work of many important external committees, including the technical committees of the British Standards Institution concerned with the foundry industry, the Joint Sands Committee, the Joint IBF/BCIRA Committee on Gases in Cast Iron and the new Joint IBF/BCIRA Committee on Data on Cast Iron. The Technical Council records its special thanks to those who have served on these committees as the Institute's representatives.

Work in Progress

Summarized below is the work of the active sub-committees, including that of the newly formed committee on definitions for the foundry industry and the joint committee on the revision of B.S.991, Data on Cast Iron.

T.S.24—Ingates (chairman—Mr. F. J. McCulloch): This sub-committee completed its work during the past year and its report was presented for discussion at the International Foundry Congress held in London in June. It is anticipated that the sub-committee will meet shortly to review the discussion on its work and to consider whether recommendations can be made to the Technical Council to pursue any further line of investigation.

T.S.32—Internal Stress (chairman—Mr. M. M. Hallett, M.Sc.): This sub-committee, which was appointed in 1949 "to investigate the problems of internal stress in castings" has completed its second report which

* Presented at the annual general meeting of the Institute held in Cardiff on June 13.

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will be presented at the annual conference to be held at Cardiff in June.

T.S.35—Flow of Metal (chairman—Mr. E. M. Currie, F.I.M.):

Unforeseen circumstances prevented the showing at the International Foundry Congress of the second film on the flow of metal into moulds prepared by this sub-committee. The film, which deals with points raised during discussion on the first film, will be shown at the forthcoming annual conference at Cardiff.

T.S.37—Cast-iron Tests and Specifications (chairman—Mr. J. E. O. Little):

This sub-committee was appointed in March, 1951, with the following terms of reference:—

> "To review the British Standards Institution's test specification for cast iron with special reference to: (i) The transverse test for grey iron, with particular reference to the deflection test, and (ii) the relationship of test-bar to actual casting thickness."

Coincidental with the completion of the sub-committee's work and the preparation of its report, the British Standards Institution undertook a review of the British Standard for grey cast-iron. Based on sub-committee T.S.37's report, the Institute has submitted views on the revision of the British Standard and pending completion of the revision of the Standard, a draft of which has been circulated for comment, the disposal of sub-committee T.S.37's report is in abeyance.

T.S.39—Mould Drying (chairman—Mr. W. J. Colton):

Formed in March 1951 to review the factors involved in the drying and skin-drying of moulds, with special reference to the rate of removal of moisture from the mould surface, this sub-committee has carried out a great deal of investigational work during the past year. Based on the results of tests carried out, the sub-committee is of the opinion that there is no appreciable difference between drying by radiant heat and by the air recirculating method. Experiments have been undertaken to determine the relationship between moisture pick-up, loss of strength, the electrical resistance of dry sand and also to assess the depth of drying on production floor moulds. It is considered likely that the new Factory Act which came into operation earlier this year, will have some influence on the work of the sub-committee. The sub-committee's aim in the immediate future is to develop the practical aspects of mould drying on a production basis, but an interim report covering work done up to the present time is being prepared prior to embarking on a further programme of tests.

T.S.40—Atlas of Typical Non-Ferrous Microstructures (chairman—Mr. A. Logan, F.I.M.):

This sub-committee has now completed the preparation of the non-ferrous section of the "Atlas of Microstructures" and it has been passed to the co-ordinating committee appointed to review the three parts of the Atlas before publication. It is hoped that publication of the Atlas in combined book form will be effected during 1956.

T.S.41—Atlas of Typical Steel Microstructures (chairman—Mr. C. H. Kain, A.M.I.Mech.E., F.I.M.):

The completed steel section of the Atlas prepared by this sub-committee has been in the hands of the co-ordinating committee for some time, and it has not been necessary to meet during the past year.

T.S.42—Atlas of Cast-iron Microstructures (chairman—Dr. Brynmor Jones):

Pending review by the co-ordinating committee of the completed cast-iron section of the Atlas, this sub-committee has also been inactive except for some slight revision made necessary by the impending British Standard on spheroidal-graphite or nodular iron and the revision of B.S. 1452.

T.S.43—Cupola Development (chairman—Mr. E. S. Renshaw, F.I.M.):

This sub-committee was appointed in December, 1951, the terms of reference being:

> "To investigate the hot-blast system, carburization, desulphurization, water cooling and combinations of these."

Since the presentation of its first report at the annual conference of the Institute held at Glasgow in June, 1954, the sub-committee has been extending its collection of operational data on hot-blast, water cooling, oxygen enrichment and the use of calcium carbide. Considerable new material has now been accumulated and it is anticipated that within the next few months the sub-committee will prepare a second report.

T.S.44—Receivers (chairman—Mr. S. J. Sargood):

During the past year this sub-committee which was appointed in December, 1951, to review the value and effect of receivers, including tapping systems and slag-handling and disposal methods, has completed its work. Its report will be presented at the annual conference to be held at Cardiff in June of this year.

T.S.45—Non-ferrous Quality Tests (chairman—Mr. A. Logan, F.I.M.):

Following the proposals put forward at the Buxton and Sheffield conference, this sub-committee was formed in September, 1952, with the following terms of reference:

> "To investigate the possibility of developing a suitable fracture test or other quick routine test for assessing melt quality of copper-base and aluminium-base alloys."

During the past year the sub-committee has pursued its examination of a number of tests designed to assess the quality of molten copper-base and aluminium-base alloys, including variations of a constant volume density test, a gas test devised by Dr. Ransley, a fluidity test, the reduced pressure test and various other forms of test. The outcome of all this work is now being reviewed, so that any further lines of investigation with which the sub-committee should concern itself can be determined.

T.S.46—Mould Materials (chairman—Mr. J. Hird):

The terms of reference of this sub-committee

which was formed in September, 1952, were:

"To investigate the effect of mould materials on the cooling rate in the solidification range of cast metals, with particular reference to cast iron."

The first report of the sub-committee was presented at the International Foundry Congress in June. Following this, the committee met to consider whether it could recommend that a supplementary investigation should be undertaken and as a result of its recommendations the Technical Council have re-appointed the committee with new terms of reference as undernoted:

"To examine the effect of mould materials on the cooling rate of cast iron and the resulting influence on physical properties."

This work will include shell-mould materials, CO_2, carborundum, zircon, oil sand, Olivene, carbon and cement. The programme of work envisaged is of notable volume and complexity, and progress will rest mainly on research facilities becoming available at Birmingham University. It is as yet too early to state that these will be forthcoming.

T.S.47—Foundry Coke (chairman—Mr. D. Fleming):

This sub-committee was formed in July, 1953, with the following terms of reference:

"To review the present position of the quality of foundry melting coke and to prepare recommendations concerning coke specification and practical tests, including mechanical tests."

At this stage it is possible to give only a few glimpses of the formidable study which this sub-committee is undertaking. During the past year the examination of the enormous literature dealing with the testing and specification of foundry coke and the problems of cupola melting has been continued, and it is anticipated that work along these lines will be necessary for some time. Evidence on one coke property, namely size effect, seemed clear enough to warrant immediate practical work and samples of Monkton and Bankfoot graded cokes have recently been made available to the sub-committee for this purpose by the National Coal Board. The initial series of tests with these graded and ungraded cokes is concerned with ascertaining obvious differences such as metal temperature and melting rate. Although work during the past year was not advanced as rapidly as envisaged, it is considered that in 1956 considerably more significant progress will be made. The immediate aim of the sub-committee is to continue practical work on the effects of size and size distribution and to extend practical work to examine the effects of ash content.

T.S.48—Non-ferrous Surface Finish (chairman—Mr. R. W. Ruddle, M.A., A.I.M.):

This sub-committee was formed in July, 1953, the terms of reference being:

"To investigate factors affecting the surface finish of sand-cast non-ferrous castings."

A steady rate of progress has been maintained during the year and the sub-committee hopes to complete a first report covering the work on moulding sands later this year. Satisfactory progress is being made with work on core sands, and a series of experiments is at present being conducted in the dressing of cores and mould surfaces to prevent metal penetration. Several new items of work, including that on the effect of fineness of sand on penetration in shell moulds, the effect of pattern quality, influence of method of ramming and the effect of pouring temperature have been undertaken. Investigations are also in hand to determine whether alkaline additions to raise the *p*H of the sand improves surface finish. If the present rate of progress can be maintained the sub-committee anticipates that the bulk of remaining work will be completed during 1956-57.

T.S.49—Feeding of Castings (chairman—Mr. H. G. Hall, F.I.M.):

Sub-committee T.S.49 was also formed in July, 1953, its terms of reference being:

"To investigate methods of improving the feeding of castings with special reference to increased yield per unit weight of material melted, with due regard to overall economy."

During the past year this sub-committee has continued with its programme of experiments and has completed several tests in various metals. Satisfactory progress is being maintained on work on feeders of reduced diameters. A number of tests with high-duty irons using the side feeding method have been carried out and further tests with this iron, gating from the bottom, are now in progress. Tests on steel castings from which good yield figures have been obtained are being repeated with bottom runners instead of the top runners previously used. Numerous non-ferrous experiments have been conducted but it is considered that several results are somewhat obscure and further experiments in this field are being repeated at lower temperatures. Work on aluminium-bronze, manganese-bronze and Monel metal, and on the use of fly ash as a normal anti-piping compound has recently been undertaken, and experiments in the use of exothermic and insulating materials are progressing favourably. Much work admittedly remains to be tackled, and the sub-committee is now reviewing past work with a view to outlining a programme of further work necessary to complete its study of the subject.

T.S.50—Design of Castings (chairman—Mr. J. Blakiston):

Arising from the presidential address of Mr. John Bell at the Glasgow conference, it was decided at the October, 1954, meeting of the Technical Council to appoint this sub-committee with the following terms of reference:

"To review the problems associated with casting design in relation to foundry production with special reference to (*a*) the moulding and metallurgical considerations involved; (*b*) the effect of design on casting defects and on the economical production of castings; and (*c*) the preparation of a report which, with the co-operation of the engineering institutions

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concerned, may be developed into a code of practice."

For some twelve months the sub-committee laboured at a review of all the technical literature on the subject, from which the satisfying conclusion was formed that practically all the information required already existed, but in a very diffuse form. Since then the work of abstracting this information has proceeded and it is intended to collate it in the form of a report to be entitled "Guide to Casting Design."

T.S.51—Terms and Definitions for the Ironfoundry Industry (chairman—Mr. J. W. Gardom):

At the September, 1955, meeting of the Technical Council the above sub-committee was appointed with the following terms of reference:

"To review and amend the draft terms and definitions for the ironfoundry industry prepared by the British Standards Institution."

The first meeting of the sub-committee is expected to take place just after the close of the year under review.

Joint Committees

Joint IBF/BCIRA Committee of Gases in Cast Iron.

This committee's report was presented at the International Foundry Congress, and is now being presented at a number of branch meetings. In due course a meeting of the committee will be convened to review the position and decide whether or not further work is possible.

Joint Sands Committee.

Following the publication last year of this committee's report dealing with the shatter index and the mechanical analysis of sand, the committee has had no work in progress.

Joint Committee on Data on Cast Iron.

At the September, 1955, meeting of the Technical Council a recommendation of the chairman's advisory panel was accepted that a committee could usefully be formed with the following terms of reference:

"To review current available data to assist the British Standards Institution in the revision of BS 991."

The proposal received the cordial approval of the British Standards Institution and the British Cast Iron Research Association has accepted an invitation to co-operate in the work.

Election of Chairman and Vice-chairman, 1956-57

At the March meeting of the Technical Council, Mr. A. E. Peace and Mr. J. McPheat were unanimously nominated for re-election as chairman and vice-chairman of the Technical Council respectively, for the year 1956-57. This recommendation was unanimously approved at the meeting of the Council held on April 21, 1956.

The report is signed by Mr. A. E. Peace (chairman of the Council).

GATT Talks Favour Britain

Britain gained more tariff concessions than she conceded as a result of the latest series of negotiations of member countries of the General Agreement on Tariffs and Trade. A White Paper giving details of the new GATT agreement reveals that, based on terms of 1954 trade, UK exports valued at £104,000,000 will benefit from the reduction in other countries' import duties, while imports into Britain worth some £94,000,000 will gain from UK concessions. The products on which British import duties are to be reduced include motor cars and parts, including tyres; motor cycles over 800 c.c.; aircraft and parts; metal-working machine tools, and much machinery, including mining, electrical, and textile machinery and some printing machinery; and some steel plates and sheets.

The annual report prepared by the secretariat of GATT, shows that international trade in 1955 was both greater in volume and more valuable than ever before. The volume of the world's trade in the second half of 1955, the report says, was over one third greater than in 1950 and more than one fifth above that of 1951. In addition, the rate at which the world's trade has been growing has been higher each year since 1952, and reached a new high level last year, when the volume of international trade was nearly 9 per cent. above that of 1954. The value of international trade reached an annual rate of $86,000 million in the second half of 1955, which was 13 per cent. higher than in 1951.

Mr. JOHN EDWIN ALLAN, formerly a director of the Leeds Brass Finishing Company, Limited, has died at the age of 76.

New Talks on Inflation

Representatives of the Government, the nationalized industries, and private industry are to meet shortly to discuss stabilization of costs and prices. This suggestion, which was put forward by representatives of the British Employers' Confederation and the Federation of British Industries during their meeting with the Prime Minister and other members of the Government at the House of Commons on June 11, was welcomed by the Government.

On June 13 Mr. Macmillan, the Chancellor of the Exchequer, received a deputation from the National Union of Manufacturers, led by Lord Rochdale, the president, to discuss their anxiety about holding manufacturing prices in the face of dwindling margins. In a statement issued afterwards, the Union said its representatives told the Chancellor that manufacturers were at one with the Government in their efforts to master inflation and develop exports, but the prices charged for basic materials and services, including those supplied by the nationalized industries, were an uncontrollable element in manufacturing costs. Smaller manufacturing firms in particular were at the mercy of these basic charges and the wage standards set by the big employers of labour.

TECALEMIT, LIMITED, of Plymouth, Devon, manufacturers of lubrication equipment, announce that they have concluded a licence agreement with the Globe Hoist Company of Philadelphia, USA, whereby Tecalemit will manufacture and sell Globe car hoists in the UK and all parts of the world except the USA.

Company News

INDIAN IRON & STEEL COMPANY, LIMITED—The company has obtained Government sanction for a one-for-one rights offer of ordinary shares at Rupees 13 annas 8 a share. In according its sanction, the Government stipulated that no fresh issue of capital should be made until after November 1.

GODWIN, WARREN & COMPANY, LIMITED, iron and steel stockholders, of Bristol—A final dividend of 15 per cent., making a total of 17½ per cent. for the year ending March 31, 1956, compared with 15 per cent. in the previous year, is recommended by the directors. Consolidated trading profit, subject to audit, amounted to £95,330, compared with £58,292 the year before.

CHINESE ENGINEERING & MINING COMPANY, LIMITED—Proposals for reorganizing the capital of the company were passed at a meeting on June 11. The scheme provides for the conversion of the existing share capital into preference shares and the right to the holders of preference to convert up to one quarter of their holdings into ordinary, as at the date when confirmation by the Court of the reduction in capital is granted or refused.

VACTRIC, LIMITED, electrical and mechanical engineers, of London, W.1—The company announces a dividend of 17½ per cent. for the 53 weeks ended March 31 last on £450,000, compared with 15 per cent. on £300,000 previously. Earlier this year ordinary shareholders received a 50 per cent. scrip issue in "A" ordinary and 50 per cent. in 6 per cent. cumulative preference shares. Subject to audit, group profits expanded from £548,688 to £662,730.

BILSTON FOUNDRIES, LIMITED—The board recommends a final dividend of 5 per cent., less tax, making 22½ per cent., less tax, on the £280,000 one-class capital, for the year to March 31, 1956. For 1954-55 the equivalent of 21¼ per cent. was paid on the £210,000 capital, before a one-for-three rights issue. It is also proposed to make a scrip issue on a one-for-two basis, subject to Treasury sanction. The profit for the year is £200,759, against £190,302 in the previous year.

CHAMBERLIN & HILL, LIMITED, ironfounders, of Walsall (Staffs)—Output in the year to March 31 was appreciably higher than that of the previous year and trading profits increased by £34,287 to a record £95,899. The chairman, Mr. G. A. L. Hatton, warns that trading conditions are definitely less easy than they were 12 months ago. The order-book is satisfactory, however, and production at present is higher than ever before, a rate which he believes will be maintained for several months.

BRITISH ALUMINIUM COMPANY, LIMITED—The issue of 2,000,000 £1 ordinary shares was accepted on provisional allotment letters to the extent of 1,929,927 shares. Employees of the company and its subsidiaries submitted 315 applications for a total of 40,219 shares, in respect of which 33,322 shares have been allotted. Applications for additional shares by ordinary stockholders amounted to 846,175 shares and allotments have been made by ballot with a maximum of 50 shares on applications drawn.

A. BOAKE ROBERTS & COMPANY (HOLDING), LIMITED, industrial chemical manufacturers, of London, E.15—The company is adding a 2½ per cent. bonus to an unchanged 11 per cent. final dividend recommendation for the year to March 31, 1956, making a total of 17½ per cent., against 15 per cent., on the £475,000 ordinary stock. Group profits, which in the previous year showed a further big recovery from the 1952-53 setback, have again increased, amounting to £504,815, compared with £425,048, before tax.

HATTERSLEY (ORMSKIRK), LIMITED, engineers and ironfounders—The directors have under consideration a scheme for further modernization and expansion which will involve a capital outlay estimated at £250,000, says the chairman, Mr. T. Heap. During the year to March 31 last, demand outstripped the increased production obtained from additions to both buildings and plant. Compared with March 31, 1955, there are practically double the number of fittings outstanding on the order-books to-day, the chairman adds.

RANSOMES & RAPIER, LIMITED—Mr. R. R. Stokes, the chairman, presiding at the annual meeting, said that the decision of the NCB to embark upon a long-term plan for open-cast coal should provide opportunity for the sale of large walking draglines, but their supply to meet requirements would not prove possible unless the Ministry of Fuel and Power and the Ministry of Agriculture agreed on the sites to be worked at an early date. This was important, as, with insufficient time to construct the machines, the orders would inevitably go to the United States.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference ESB can be obtained from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771), unless otherwise stated.

PAKISTAN, June 28—Cast-iron pipes and specials, for the Stores Department of the Karachi Port Trust. (ESB/14893/56.)

SOUTH AFRICA, July 12—Cast-iron working standard weights, for the Union Tender and Supplies Board. (ESB/14967/56.)

SOUTH AFRICA, September 21—Air compressors, for the Stores Department of the South African Railways. (ESB/14351/56.)

SOUTHERN RHODESIA, July 25—Electric overhead travelling cranes and spares, for the Purchasing Board, Rhodesia Railways. (ESB/14208/56.)

Changes of Name

Among the companies which have recently changed their names are those listed below. The new titles are given in parentheses.

ROLLASON ENGINES, LIMITED, Croydon Airport, Croydon, Surrey (Rollason Aircraft & Engines, Limited).

METCALF STREET ENGINEERING COMPANY, LIMITED, Oakland Road, Leicester (Metcalf Engineering Company (Leicester), Limited).

TURNER'S ENGINEERING FORGINGS, LIMITED, Canal Street Works, Rochdale, Lancs (Turner's Engineering Units, Limited).

ENTWISTLE STAINLESS FITTINGS, LIMITED, Townfield Works, Townfield Street, Oldham, Lancs (Entwistle (Oldham), Limited).

J. RESIDE, LIMITED, merchants and manufacturers of machinery, tools, etc., of Delph Street, Halifax (Rastrick Engineering, Limited).

Recent Wills

SCREETON, S. A., chairman of Farrow & Jackson & Purdy, Limited, machinery manufacturers, etc., of London, E.1 ... ... £10,065

BARON, J. H., cashier at the Beauvoir Works, Luddenham (Yorks), of C. Lindley & Company, Limited, bolt and nut makers, engineers' merchants, etc. £4,549

BLACKBURN, ROBERT, chairman of Thomas Green & Son, Limited, ironfounders and engineers, of Leeds and London, and founder and chairman of Blackburn & General Aircraft, Limited ... £131,786

Book Reviews

Foundry Ventilation and Dust Control—Proceedings of a conference held at Harrogate and published by the organizers—the British Cast Iron Research Association, Alvechurch, Birmingham; price £2 (post free) to members, or £3 or $10 to non-members.

The proceedings of this conference at Harrogate, 1955, are presented in cloth-bound book form and contain comprehensive reports of the fifteen papers presented, together with summaries of the subsequent discussions; a note is included of the various films shown. The subjects covered by the reports give a most comprehensive study of the formation and dispersal of dust in foundries, and of the best methods so far devised for its reduction and control. Further experimental data which have become available since the time of the conference are also included.

The majority of the papers were presented by members of the BCIRA Development Department, but the foreword and the introductory address were given by Sir George Barnett, H.M. Chief Inspector of Factories. These "set the scene" for the conference and outline the work of the BCIRA foundry atmospheres committee and the Joint Standing Committee on Conditions in Foundries. The address also surveys the report, then about to be published by the Joint Standing Committee, covering the generation of dust and methods recommended for its control and collection. It also deals with prevention of accidents, the greater emphasis now being placed on safety precautions in factory layout and the relation of these activities to the conference.

The papers which follow deal very fully with the various aspects of the subjects of dust emanation and control and ventilation in foundries. The initial contributions review the causes of dust, such as those as are met with in fettling and dressing operations and from cupolas, and set out methods which can be used to mitigate nuisance, both by the use of such techniques as core assembly and wet de-coring (which reduce the amount of sand adhering to castings and thereby reduce the incidence of dust creation) and by the correct design and application of systems of control to remove dust particles, the generation of which is inherent in the process which is being carried on, *i.e.*, grinding or fettling, etc. Foundry lighting is also discussed, as this was considered to be closely related to and affected by dust control.

Extensive research has been undertaken by BCIRA into the question of dust formation and distribution, and also the characteristics and behaviour of dusts so as to establish principles for suppression and control of their movement, and to examine the thermal effects encountered in foundrywork. Several papers are devoted to this work, descriptions being given of the experiments carried out. The results achieved are tabulated, and expressed graphically and the methods used illustrated by photographs, practical examples being quoted to indicate the methods of applying the results obtained. The limitations of empirical formulae for calculating ventilation volumes and the air velocities required for sufficient entrainment are mentioned and a number of critical factors examined. Individual views of some manufacturers of control equipment are reported and questions of general ventilation in small foundries with respect to thermal phenomena are also examined. The important subject of the hazard presented by noxious gases is investigated.

Considerable attention is given to particular applications of dust-control methods to grinding machines, of the pedestal, swing-frame and portable types, and experiments are described and the resulting data relating thereto are published. An interesting description is given of the methods used in France for dust collection and the testing of air-cleaning equipment in foundries. The final papers refer to the important functions of cleaning and maintenance, and describe in some detail the very effective equipment which is available for the dust-free de-coring of castings and the collection of dust at its source on portable hand tools, by the use of low-volume high-pressure extraction systems. The publication forms a sound basis for the guidance of all concerned with dust and ventilation in foundries.

J. W. A.

Definitions and Formulæ for Students—Metallurgy (5th edition), by E. R. Taylor; published by Sir Isaac Pitman & Sons, Limited, Parker Street, Kingsway, London, W.C.2; price 1s. 6d.

Despite the 50 per cent. price increase since the last edition, this little booklet remains very good value for money. Although one might wish that definitions of investment moulding, shell moulding, and CO_2 Process, for instance, might now be added to the foundry section, no doubt if such extensions were made to all the facets covered, the book would become bulky and expensive. As it is, 43 pages have grown to 60 in the present edition. If too large, it would defeat the objective, which is to provide students and not-too-technical men with a handy pocket compendium of useful general definitions. The reviewer finds the section on test-bars and testing especially helpful. This booklet could help many practical foundrymen, too, to meet on common ground with their metallurgical colleagues.

Publication Received

1955 Report of the British Iron and Steel Federation. Published from Steel House, Tothill Street, London, S.W.1.

This is a success story, as the report shows that the output of steel is growing at the rate of about 5 per cent. per annum. Growth involves growing pains, and amongst these encountered last year, was the shortage of ships to bring iron ore to the country as so much space was required for importing coal. A very interesting table is included, which analyses the indirect export of steel in 1954 and 1955. If a similar table could be evolved for castings, it would underline the importance of the foundry industry to this country's export industries. Technically, too, the iron industry has done well as it has, since 1946, reduced its coke consumption from about 22 cwt. to 19 cwt. per ton of iron produced. During the same period the yearly production of pig-iron per furnace rose from about 98,000 tons to over 150,000 tons. It is sad to relate that of all the material turned out by the iron and steel works, the heaviest price increase (9¼ per cent.) was for foundry pig-iron. The reasons are well known—but still an effort should be made to improve matters. From appendix III, it is shown that the foundry is a very important client, as the following extract shows in terms of thousand tons:

Iron for foundries	1953	1954	1955
Production	2,237	2,227	2,345
Imports	80	25	48
Exports	3	18	29
Stock changes*	−95	−4	−53

The reviewer knows no easier means of getting an overall picture of the iron and steel trade than by consulting this report.

* The — sign means added to stock.

News in Brief

WILLIAM ASQUITH, LIMITED, machine-tool manufacturers, Halifax, have opened a new engineering department at Birmingham.

ABOUT a thousand visitors toured the works of the Northern Aluminium Company, Limited, Birmingham, on June 9, when the firm held an "open day."

MAJOR G. H. FREEMAN, works director at Hadfields, Limited, steelworks, Sheffield, welcomed 16 Norwegian foundry workers on June 13, when they toured the factory.

CONTRACTS have been placed for a £10,000 building at Durie Foundry, Leven, which is owned by James Balfour & Company. The building will include washing and locker-room facilities for 100 workers in the moulding shop.

AN INDUSTRIAL CONFERENCE on "Modern Management and Increased Productivity," organized by the European Productivity Agency of the OEEC (Organization for European Economic Co-operation) was held at Deauville, France, from June 4 to 8.

HENRY WIGGIN & COMPANY, LIMITED, Millbank, London, S.W.1, announce that they have purchased the specialized high-nickel-alloy fabricating plant at Hereford, which they designed and erected for the Ministry of Supply and have been operating since 1954.

THE CANADIAN NEWSPAPER, the *Ontario Intelligencer*, issued on June 7, a special supplement commemorating the official opening of a large extension to the Deloro Stellite plant. Included in the extension are shops devoted to the precision-investment process of casting. It carries an article on this department by Mr. G. W. Paget, A.I.M., the superintendent.

THE ASSOCIATION OF BRONZE & BRASS FOUNDERS announces that a meeting of members in the Midland area will be held at the Victoria Hotel, Wolverhampton, on June 28, commencing at 11.45 a.m. This will be followed at 2.15 p.m. by an Advisory Service meeting (open to all bronze and brass founders in the area) when a talk will be given by Mr. J. L. Rice on shell moulding and the CO_2 Process.

THE NATIONAL TRADES TECHNICAL SOCIETIES held their annual conference at the Pavilion, Sheffield, on Saturday, June 9, when over 200 members attended. Mr. P. J. C. Bovill was elected president, and Mr. A. Bradley was elected chairman of the National Development Committee. Professor R. J. Sarjant became chairman of the honours committee, Mr. G. Parkin, treasurer, and Mr. W. H. Bolton, secretary.

LONDON ALUMINIUM COMPANY, Birmingham, has reached an agreement with a German firm which holds Patents for anodized aluminium to use their process in Britain for car accessories. Plant is now being installed in the Witton works of the company for the manufacture of body fittings processed by the method, and it is anticipated that production will begin with accessories for cars within the next two months, and follow on a large range of other products.

A FOUR-DAY COURSE at Sheffield University on air pollution is to be arranged for September if there are a sufficient number of students enrolled. The director will be Professor M. W. Thring, professor of fuel technology and chemical engineering, and the course is being organized in co-operation with the Yorkshire Council for Further Education. It is intended for those concerned with industrial plant, fuel and domestic appliances. The sources of air pollution and methods of elimination will be examined.

AFTER BEING RETUNED and renovated at the Bell Foundry of John Taylor & Company, of Loughborough, two disused bells from Nottingham Mechanics Institute, Nottingham, are on their way to Townsville, Queensland, Australia, where they will be erected in the tower of a girls' school. One bell weighs 5 cwt., the other 2¾ cwt. As the bells are a gift from one educational establishment to another, the Loughborough bell founders retuned the bells as a token of goodwill, free of cost. The bells were originally cast by John Taylor & Company in 1877.

THE ECONOMIC IMPORTANCE of scrap metal recovery was stressed on June 13 by Mr. Derek Walker-Smith, Parliamentary Secretary to the Board of Trade, when he spoke as chief guest at the annual luncheon in London of the National Association of Non-Ferrous Scrap Metal Merchants. Referring to the call to liberalize non-ferrous scrap exports, Mr. Walker-Smith said the Government was not dogmatic about scrap exports and had the problem constantly under review. There was, however, a necessity for the conservation of home scrap supplies and the avoidance of a one-way flow out of the country which would injure Britain's balance of payments.

LORD KEYES, vice-chairman of Mappin & Webb, speaking at the annual meeting on June 15, said "The fame of the name of Sheffield has never been higher, and this is a tribute to the wonderful craftsmen who work in our factories." He also spoke of plans to attract skilled young craftsmen into the industry and proposed extensions to the Sheffield works. Mr. H. M. Oppenheim, managing director, said that the firm was considering erecting a factory in Ulster with ultra-modern production methods to compete with German, Swedish and Italian productions. He said this would not be an alternative to Sheffield but additional, though skilled men from the Sheffield works may be asked to act as supervisors in Ulster.

AMONG opinions expressed on automation, at a one-day conference of industrial workers from the East Midlands at the Stanton Ironworks, Limited, was that of Sir Frederick Scopes, managing director, who said the word was becoming over-used. He thought there was a good deal of danger in such catch-phrases and it was undesirable to imagine that some magic word was going to make jobs easier. Mr. J. B. Jay, head of the automatic division of an engineering firm, was concerned with the breaking-up of teams of workers. He thought the changes should be explained to the worker, and supervisors should co-operate with management. There would be a gradual changeover in most works, but no matter how automatic factories became, capable men would always be needed.

FURTHER CONSIDERABLE DEVELOPMENT was forecast for the Bradford tractor factory of the International Harvester Company at a Press conference held at the works at Idle, Bradford, on June 8. Already over 800 workers are engaged at the Idle factory to-day, compared with the 525 employees there before the former works of Jowett Cars Limited, were taken over in 1954, and it is hoped that within the next three months the figure will be raised to 1,200. This is because the company's B-250 diesel-wheel tractor has passed out of the experimental stage and concentration is now being made on full production. The present production is 15 tractors a day, but by September it is expected that 50 tractors will be coming off the the production line, thus bringing within range the eventual target of 250 a week from the present plant.

Personal

Mr. H. KIRK has been elected a director of Blakey's Boot Protectors, Limited, Armley Malleable Iron Works, Armley, Leeds.

Mr. R. C. YATES has been appointed to the board of directors of George Ellison, Limited, and associated companies, Tufnol, Limited, and Alfred Ellison, Limited.

Mr. B. W. ROOME, welfare officer of Newton, Chambers & Company, Limited, has been elected chairman of the Sheffield branch of the Institute of Personnel Management.

Airline operators have presented a plaque to Mr. ALFRED G. MCFADDEN, managing director of A. G. McFadden & Company, Limited, iron and steel stockholders, of Rutherglen, Glasgow, who has completed a total of 100,000 miles by air in pursuing his business.

Mr. W. B. TORRANCE, Mr. WALTER ALEXANDER, and Mr. G. M. MENZIES, directors of the Scottish Motor Traction Company, Limited, have been appointed directors of Alex. Findlay & Company, Limited, Motherwell, which was recently taken over by S.M.T.

Mr. F. G. TIMMINS, B.SC., has been appointed general manager of G. Clancey, Limited, engineers and iron-founders, of Belle Vale, Halesowen. Mr. B. H. ROBERTS has taken over the duties of machine-shop manager, and Mr. N. R. L. WEBSTER those of foundry manager.

Distington Engineering Company, Limited, announce that Mr. C. F. LAWSON has been appointed foundry manager, and as from June 25, Mr. G. ELLIS will act as personal assistant to the general works manager. Mr. C. SCOTT relinquishes his post of assistant works manager on June 30.

At the end of this month Mr. JAMES CAMPBELL is relinquishing his duties as a managing director and secretary of Wm. Denny & Bros., Limited, shipbuilders of Dumbarton, but will remain on the board in a consultative capacity. Mr. Campbell will be succeeded as secretary by Mr. HERBERT F. CHATTON, who for some time has acted as assistant secretary.

Mr. T. A. BIRD, sales manager of the rolls division of Armstrong Whitworth (Metal Industries), Limited, Gateshead, Co. Durham, is making an after-sales service and technical tour of South Africa, during which he will visit the rolling mills of Pretoria, Vanderbijl Park, and Que Que in Southern Rhodesia. The company received valuable orders from these mills earlier in the year.

After eight years as managing director of John Lysaght's Scunthorpe Works, Limited, Mr. WILLIAM LAVENDER JAMES retired on June 1 on medical advice. Mr. James joined the company in 1948 as a director and general manager of the Normanby Park Works, and subsequently was in charge of its £11,500,000 expansion scheme. He was appointed to the position of managing director in 1953.

Among those who have received presentations for long service with Henry Hope & Sons, Limited, Smethwick, are Mr. G. WATSON and Mr. H. C. F. BARHAM, both directors of Hope's Heating & Engineering, Limited. They have been with the concern for 25 years. Mr. C. HURLESTONE, supervisor of the heating department, and Mr. G. S. WOODWARD, who is in charge of the experimental shop, have received presentations on completion of 40 years' service.

COUNCILLOR W. G. PALLETT, managing director of Laycock Engineering, Limited, Millhouses, Sheffield, for 20 years, has resigned the post because of ill-health. He is 61 years old, and has been 36 years with the company. He joined Thomas Firth & Sons, Limited, in 1910 and went to Laycocks in 1920. He is a former president of the Sheffield and district branch of the Institute of Cost and Works Accountants and has been a member of Sheffield City Council since 1944.

The Institute of Cost and Works Accountants has elected as its president, Mr. IAN THOMAS MORROW, deputy managing director of the Brush Group, Limited. It is a significant choice because, at 44 years of age, Mr. Morrow is the youngest president of the Institute ever elected. Into the comparative few years of his business life he has packed a wealth of experience. It is, for example, as long as six years ago this summer that he led the British Productivity team on management and accounting on a 10-week tour of the United States under the auspices of the Anglo-American Council on Productivity.

Obituary

Mr. ROBERT GRAY, formerly assistant inspector of naval ordnance for the Admiralty at Janson Street, Sheffield, died on June 16 at the age of 63. He started with the Admiralty in the workshops over 30 years ago, and retired nearly two years ago.

The death has occurred at the age of 83 of Mr. JOHN MORTON, who was for 40 years a marine engineer's agent with B. Morton & Son, Sunderland. Mr. Morton served his apprenticeship at the Palmers Hill engine works of John Dickinson & Sons, Limited, and represented several companies, including Clarke, Chapmany & Company, Limited, in the Wear, Hartlepools, and Tees areas. He was one of the oldest members of the North-East Coast Institution of Engineers and Shipbuilders.

Mr. JAMES BUSSEY, a director of Thos. W. Ward, Limited, Albion Works, Sheffield, died on June 16 at the age of 69. He started with the firm in 1902, and became head of the constructional steel department in 1928. He was made a local director in 1936 and a full director in 1939. He took an important part in the schemes for the construction of many large buildings in Sheffield, including the erection of the steelwork of the University buildings, the Jessop Hospital and Kemsley House.

The death has occurred of Mr. WILLIAM PATCHETT EASTWOOD, at the age of 51. Mr. Eastwood, who was a director of the Asquith Machine Tool Corporation and chairman of George Swift & Sons, Limited, and Swift-Summerskill Limited, was a member of the council of the Machine Tool Trades Advisory Council to the Ministry of Supply. He was a founder and first chairman of the Halifax section of the Institute of Production Engineers and a former president of the Halifax Engineering Employers' Association.

Mr. RAYMOND S. HAYES, who has died at the age of 75 as a result of a motor accident, was the founder and chairman of R. S. Hayes (Pembroke Dock), Limited, ship builders and repairers. Early in his career Mr. Hayes qualified as an engineer and went to Maesteg (Glam) where he was subsequently manager of Gellihear Colliery. In 1911, however, he purchased Llynfi Brass & Iron Foundry, and in 1926 added to his interests Sheppard & Sons, Limited, engineers, of Bridgend. In 1947 he received an invitation from the Admiralty to submit a scheme for providing work for the naval employees at Pembroke naval dockyard and R. S. Hayes (Pembroke Dock) was registered in 1948.

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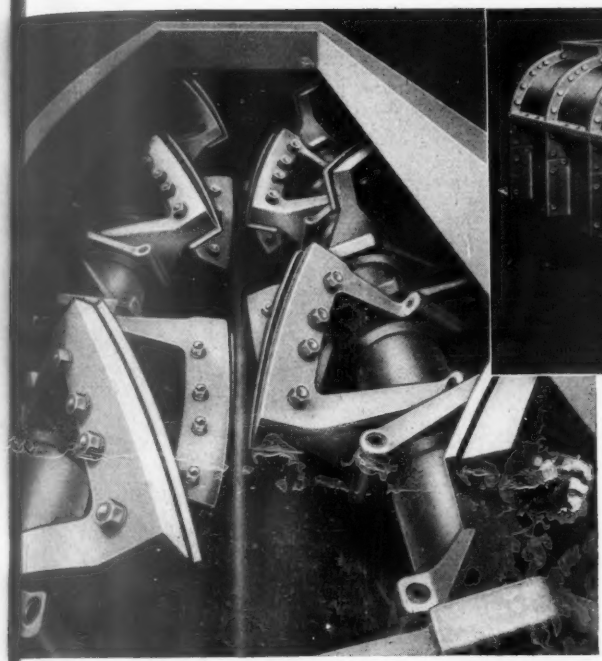

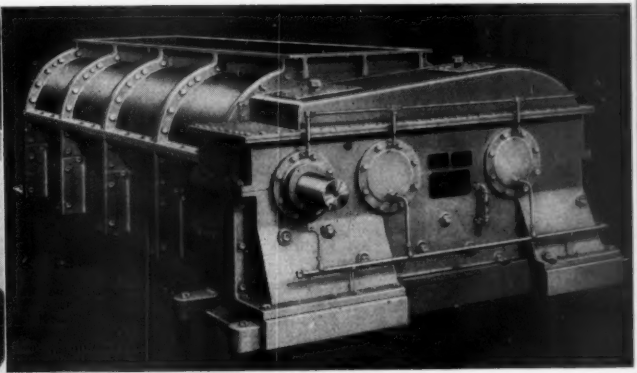

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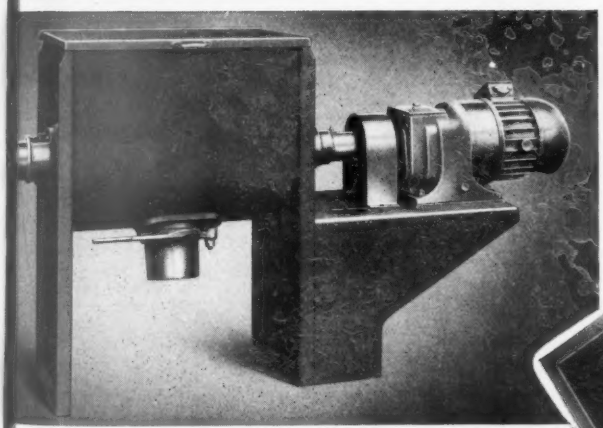

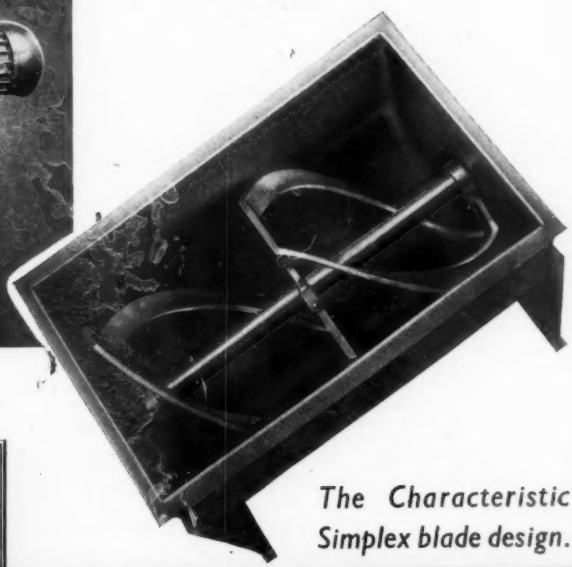

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Raw Material Markets

Iron and Steel

Pig-iron output is maintained at an average weekly rate of about 240,000 tons, of which the steelworks are receiving some 75 per cent. Even so, their needs are not adequately covered. The remainder of the pig-iron output is mainly distributed to the foundries, although an appreciable quantity of hematite is used exclusively for the steelworks in the provision of ingot moulds and other castings as well as in the production of steel. Production of low-phosphorus and medium-phosphorus iron and hematite has expanded recently, but the foundries using these grades are able fully to absorb available tonnages. Although demand from the motor-vehicle trades has eased considerably, makers of these irons have been able to send increased tonnages to producers of high-duty castings for other trades and also to provide these foundries with some tonnages for stocks, which have been practically non-existent for some time. Further, the increased supplies have enabled the foundries to curtail their buying of more expensive irons.

Supplies of high-phosphorus pig-iron, mainly for the production of light castings, are about sufficient for current consumption, although outputs are now much lower than they were. The restricted source of supply is, however, accompanied by difficulties in obtaining normal brands and analyses, particularly in the higher silicon ranges. Business at the foundries shows little change.

Apart from the engineering foundries, which cater mainly for the automobile trades, other producers of high-duty castings are very busy. The jobbing foundries are fairly well employed, but the light and textile foundries have capacity available for more work.

Foundry coke is coming forward in sufficient quantities to satisfy consumption, while supplies of scrap appear to be better than they have been for some time. The better and heavier grades of cast-iron and machinery scrap are still in good demand, but medium and light scrap is plentiful. Ganister, limestone, and firebricks are received to consumers' requirements.

The re-rollers continue to be favourably employed, plenty of business being available to take the place of completed orders. Home consumers and stockists are specifying freely for small bars, light sections, strip, etc., and practically the whole of current outputs is absorbed by them. Only a small proportion of production is being sent abroad, although much more business could be obtained from overseas buyers at favourable prices if tonnages could be spared. Supplies of steel semis are fairly satisfactory, deliveries from home steelworks being augmented with consignments from overseas. Stocks of steel semis at the re-rollers, however, are not so large as they were; this is resulting in more pressure on home steelworks for certain sizes of steel billets and special steels.

Non-ferrous Metals

A further reduction in the fixed price offered by the Rhodesian Selection Trust group to United Kingdom copper consumers came into effect on Monday. The new quotation has dropped by £20 to bring it to £300 a ton, which was the settlement price quoted on the London Metal Exchange at the close of business on Monday morning.

Values in London, however, have subsequently fallen away somewhat.

In Chile plans are being considered by the Empresa Nacional de Fundiciones for a new copper smelter and electrolytic refinery. It is reported that the new smelter will have an annual capacity of 30,000 tons. Anaconda last week began negotiations with the Chilean Government to reduce the price of copper shipped to the United States.

The copper price in London continues to fluctuate fairly freely around £300 a ton. Demand from the Continent has, at times, been good and some improvement from UK consumers has been noted. Any real movement in the price, however, will await the outcome of wage talks in the US. It was announced at the end of last week that the American Brass Company, a subsidiary of Anaconda, had reached an agreement with the Union of Mine, Mill and Smelter Workers providing concessions equivalent to 34 cents an hour. These include a wage increase of 24 cents, of which 10 cents becomes effective on July 1 and 7 cents on the same date in both 1957 and 1958.

Demand for tin has been good on both sides of the Atlantic. The buoyancy of the market largely stems from the news that the US Senate had approved the Bill extending the life of the Texas smelter until January, 1957. This it is believed, will enable the US Government to negotiate for the renewal of its contracts with Indonesia and Bolivia for concentrates for the smelter.

A further bullish point has been the news that the US is negotiating for the purchase of ore from Thailand. Tin prices in London, however, have reacted somewhat this week.

Lead and zinc have been firm markets. The chief influence at present is reports of negotiations being carried out by the US Department of Agriculture, which is bartering farm surpluses for lead and zinc. While nothing definite has been released, it is rumoured that around 50,000 tons of metal are involved.

Official metal prices were as follow:—

COPPER, Standard—*Cash:* June 14, £301 to £301 10s.; June 15, £303 to £303 10s.; June 18, £299 to £300; June 19, £294 to £294 10s.; June 20, £294 to £294 10s.

Three Months: June 14, £302 to £302 10s.; June 15, £303 to £303 10s.; June 18, £299 to £300; June 19, £295 to £295 10s.; June 20, £295 to £295 10s.

TIN, Standard—*Cash:* June 14, £745 to £746; June 15, £753 to £755; June 18, £748 to £750; June 19, £748 to £749; June 20, £749 to £750.

Three Months: June 14, £741 to £742; June 15, £749 to £750; June 18, £742 to £743; June 19, £739 to £740; June 20, £740 to £741.

LEAD—*First half June:* June 14, £116 5s. to £116 10s. *Second half June:* June 15, £116 to £116 5s.; June 18, £114 10s. to £115; June 19, £113 10s. to £114; June 20, £113 to £113 5s.

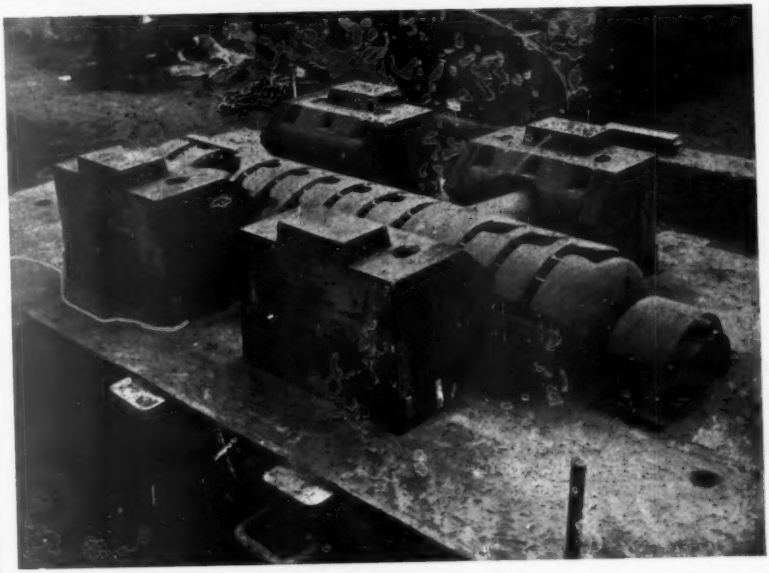
First half September: June 14, £113 10s. to £113 15s. *Second half September:* June 15, £113 10s. to £113 15s.; June 18, £112 10s. to £112 15s.; June 19, £111 15s. to £112; June 20, £111 5s. to £111 10s.

ZINC—*First half June:* June 14, £96 to £96 5s. *Second half June:* June 15, £96 to £96 5s.; June 18, £94 15s. to £95 5s.; June 19, £94 10s. to £94 15s.; June 20, £94 5s. to £94 10s.

First half September: June 14, £94 10s. to £94 15s. *Second half September:* June 15, £94 5s. to £94 10s.; June 18, £93 5s. to £93 15s.; June 19, £92 15s. to £93; June 20, £92 10s. to £92 15s.

A BELGIAN FOUNDER desires an exchange of visits between his three children and British family 2/3 weeks August/September. British founders who are interested are invited to write in the first instance to Mr. G. Lambert, IBF secretary, St. John Street Chambers, Deansgate, Manchester, 3.

Cores in bottom half of mould....



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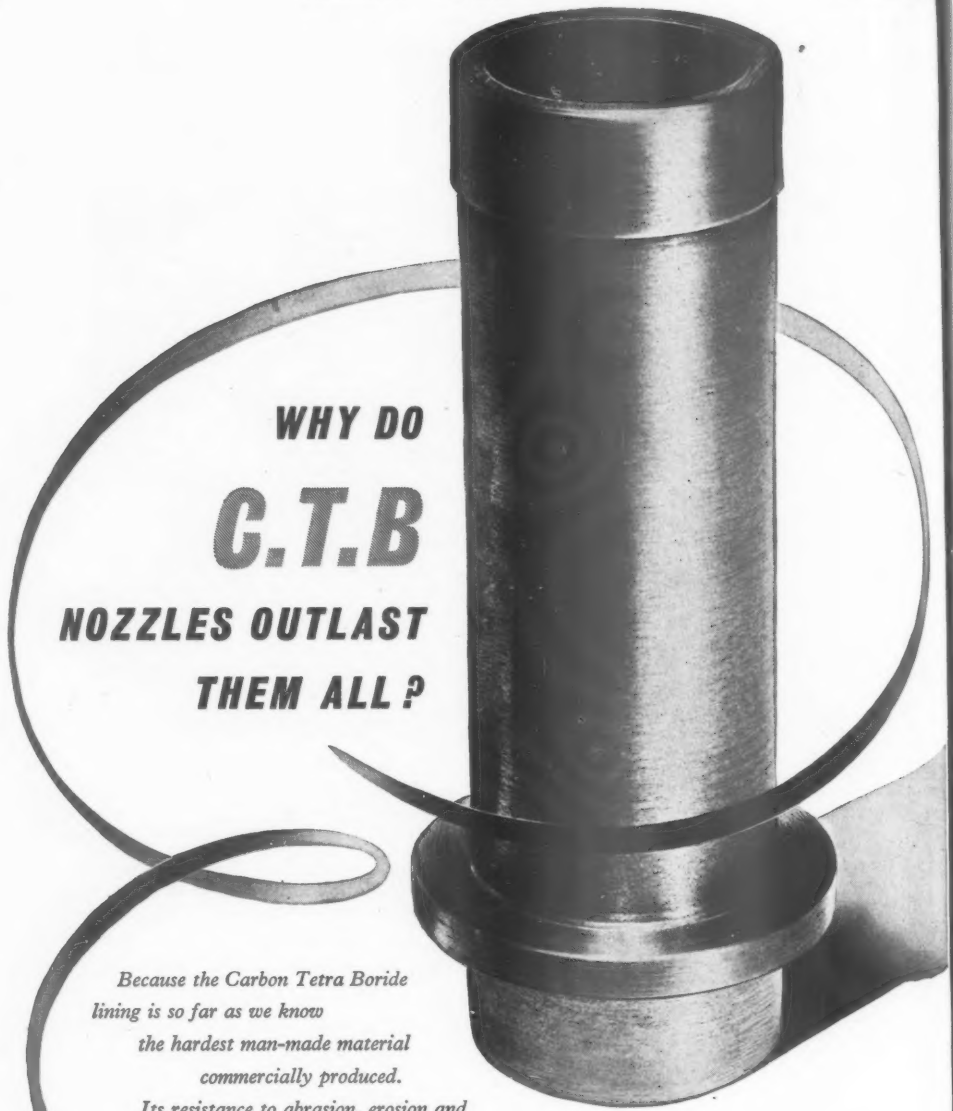

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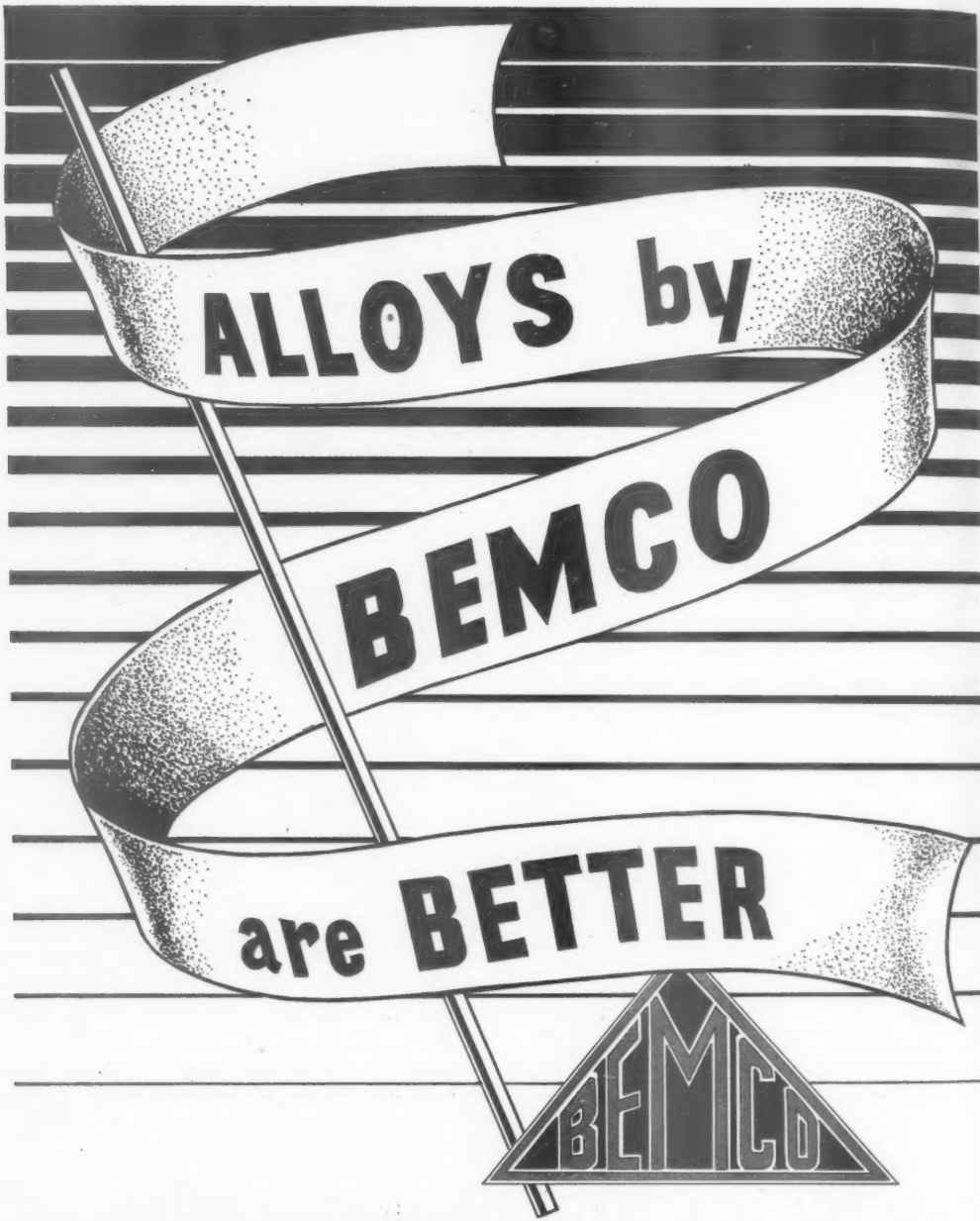

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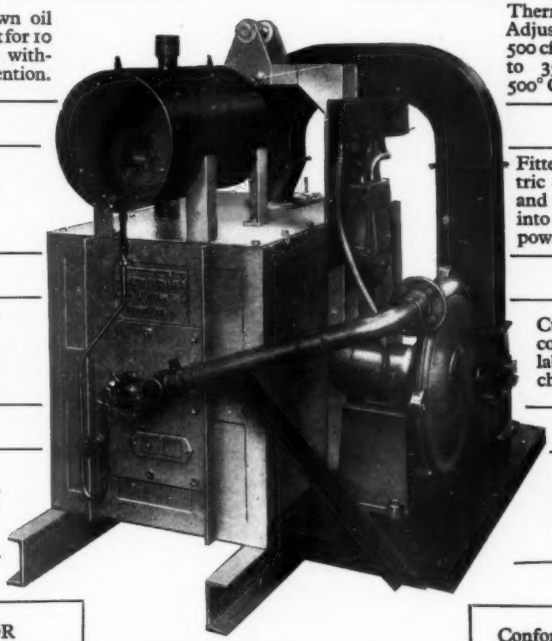

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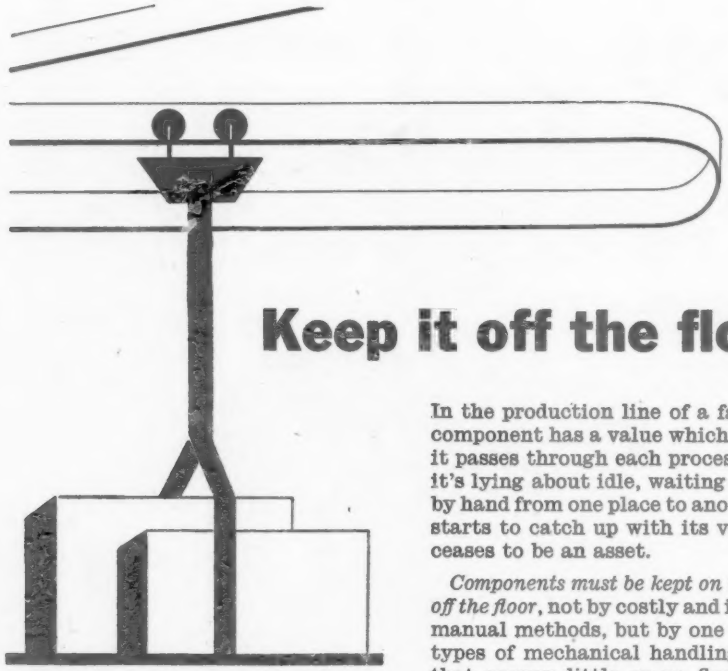

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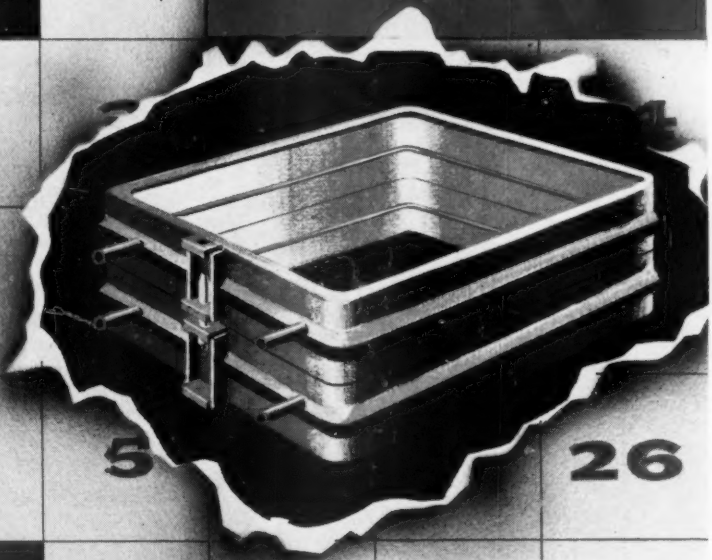
RIGIDLY	2	SPECIFICATION		
TUES.				
WED.				
THUR.	5			26
MONTH AFTER MONTH	6	13	20	27
SAT.	YEAR AFTER YEAR		21	28



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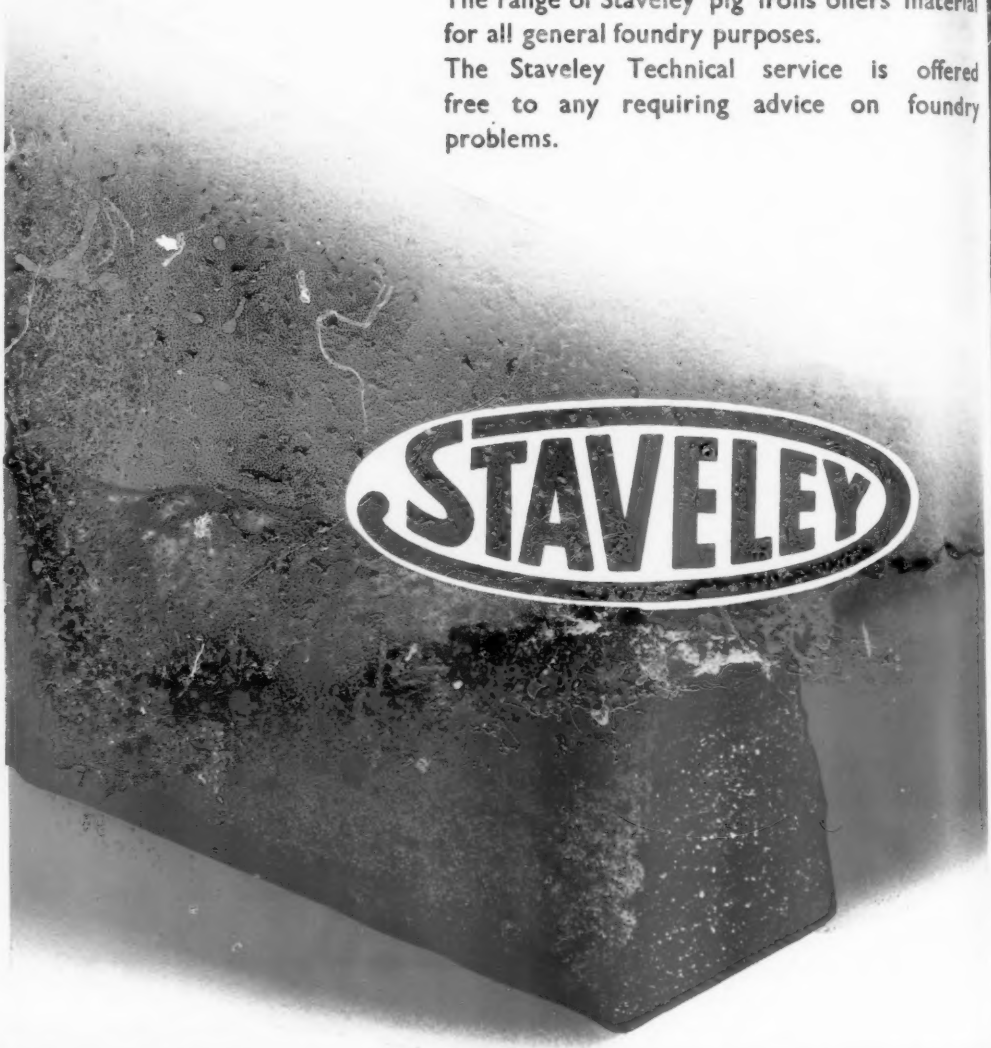

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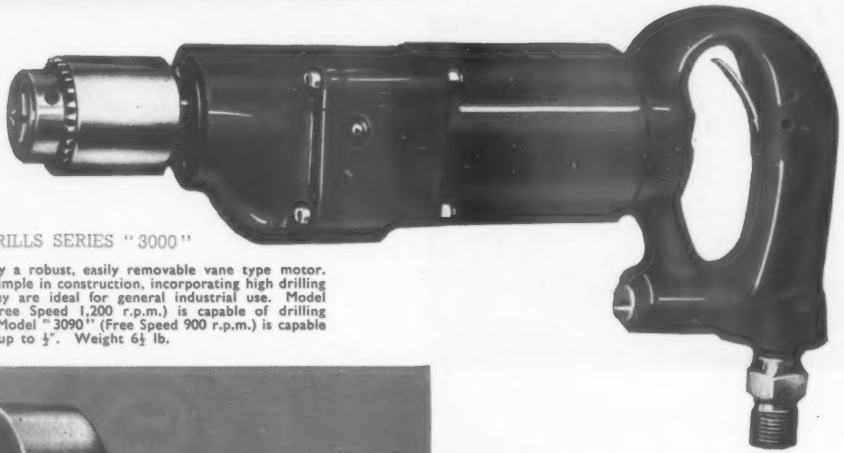

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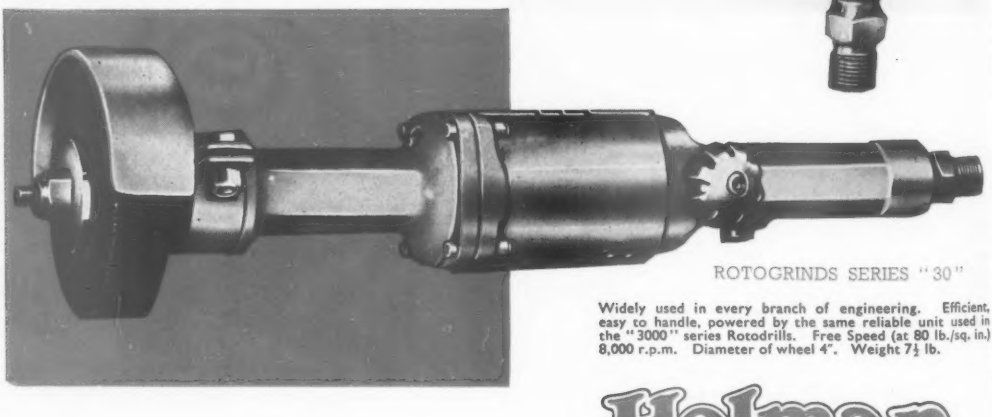

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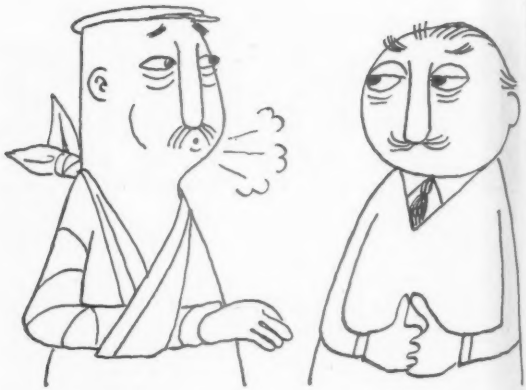

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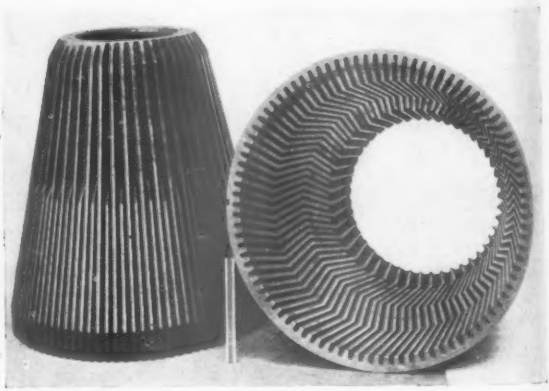

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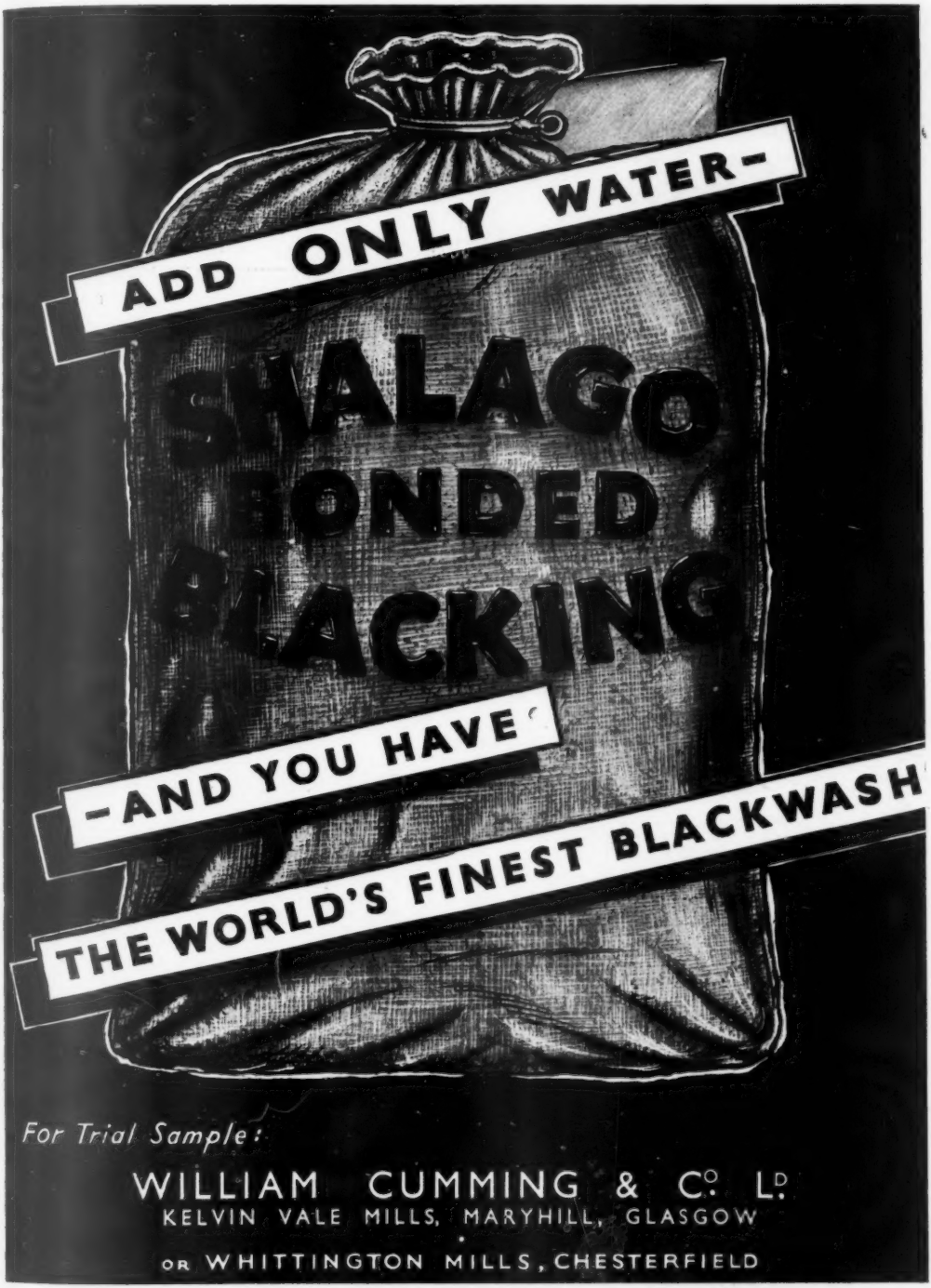
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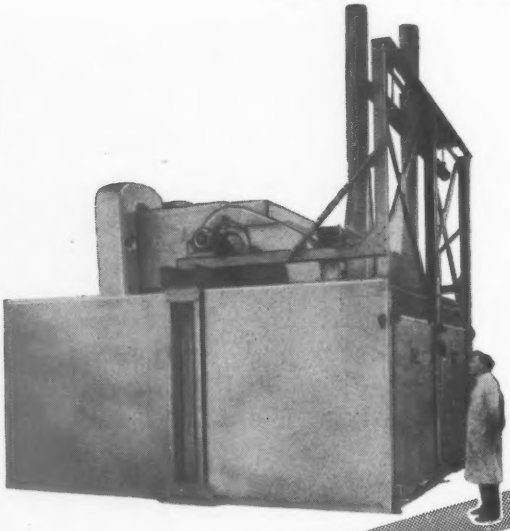

Cores are baked more quickly and evenly in this CHAL core oven with the aid of full air circulation.

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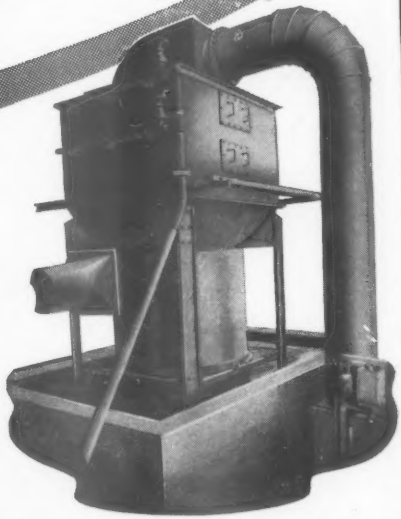

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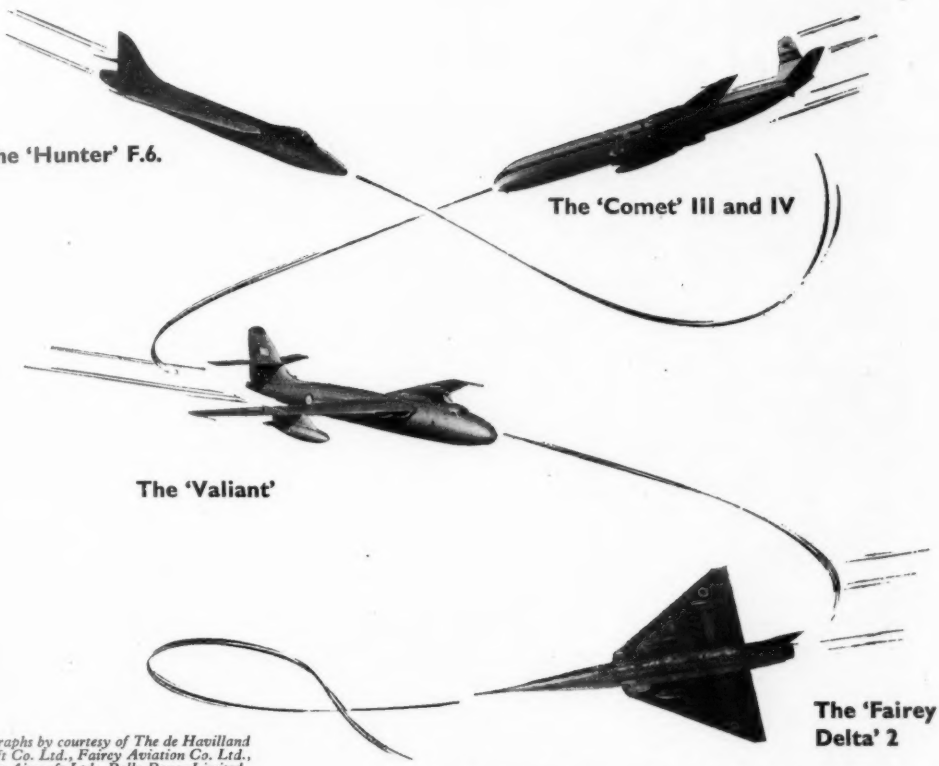

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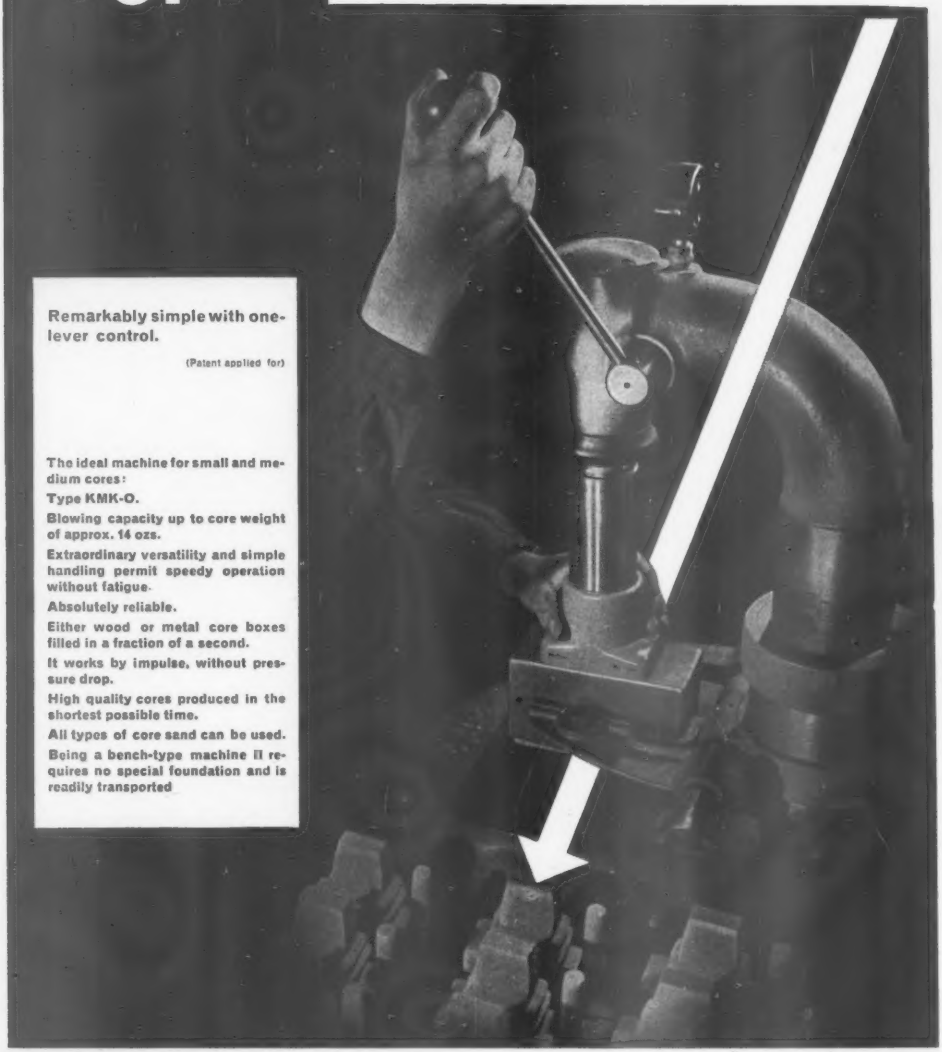

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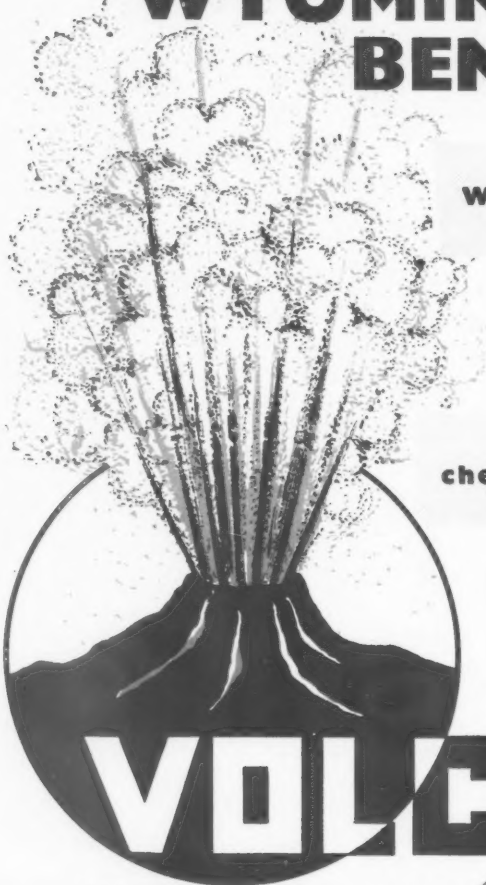

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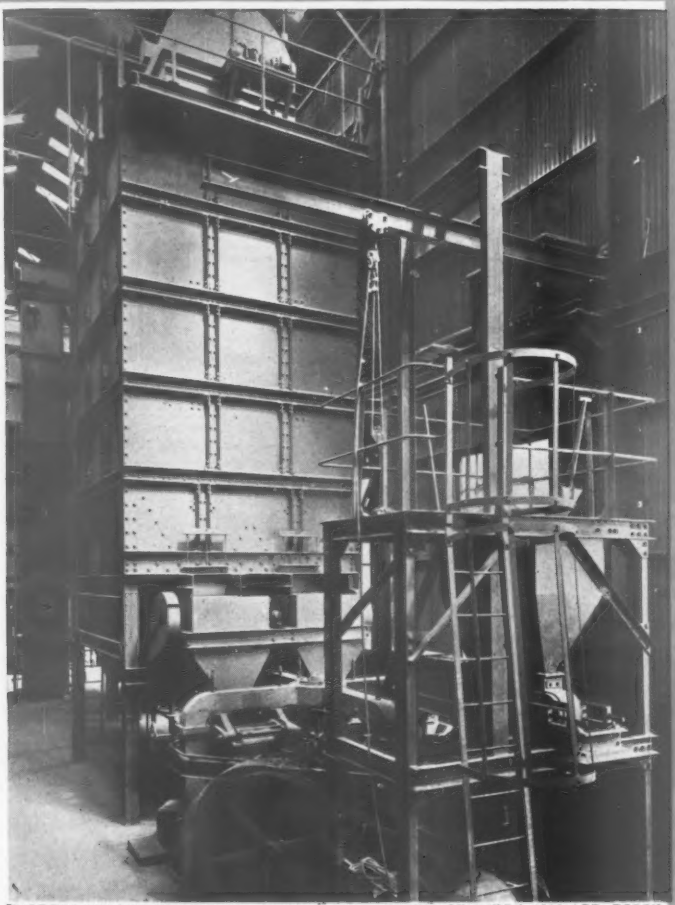

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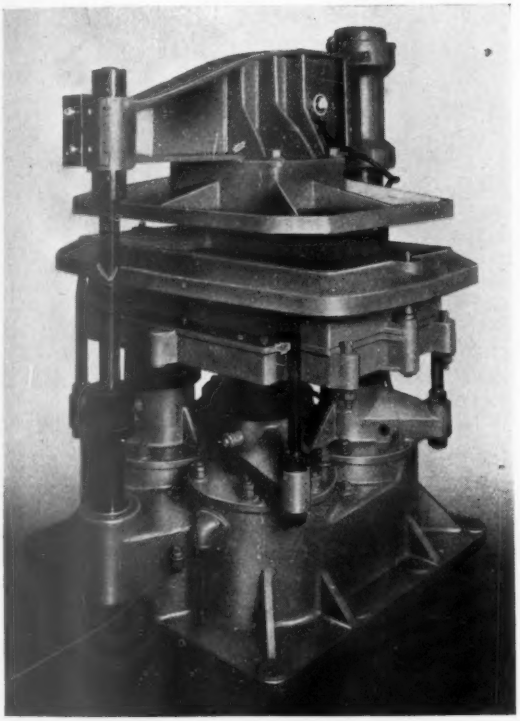

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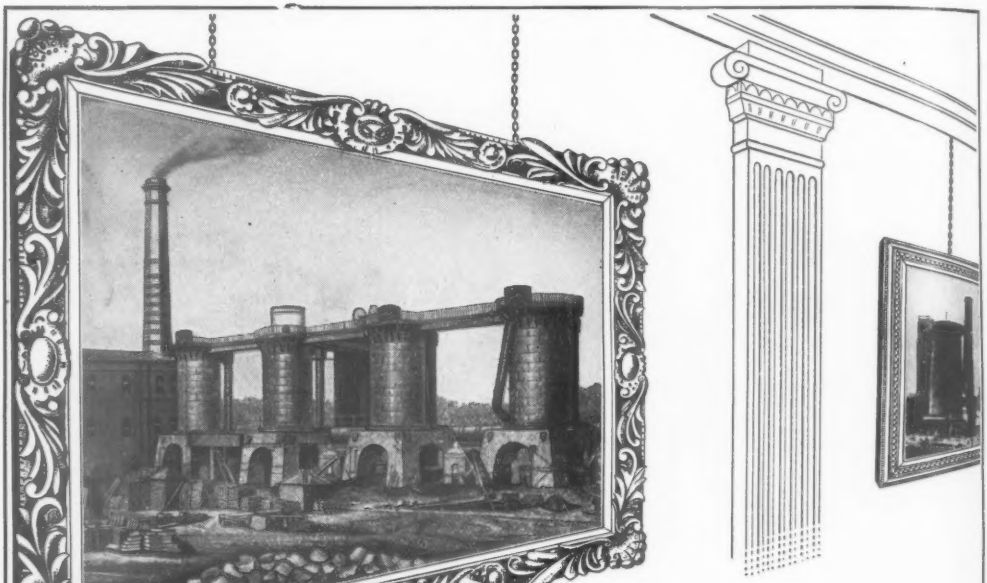

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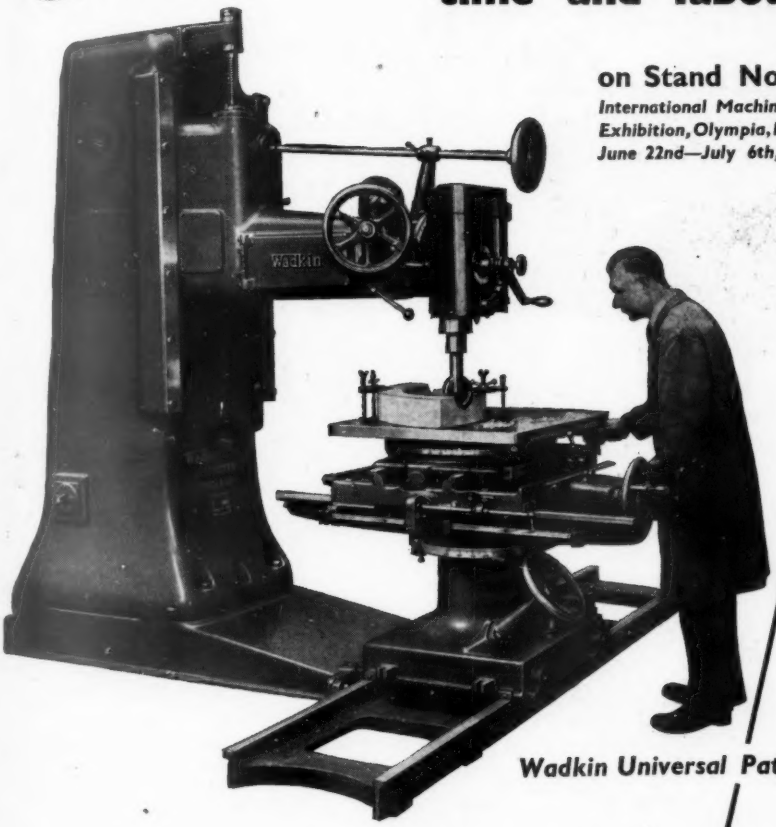

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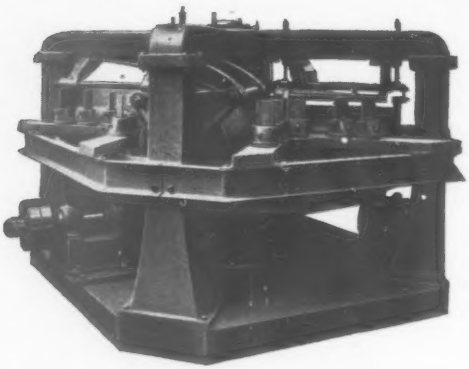

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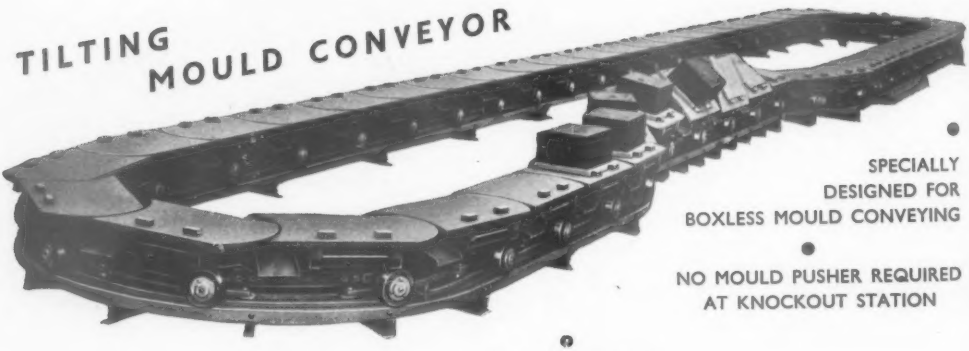

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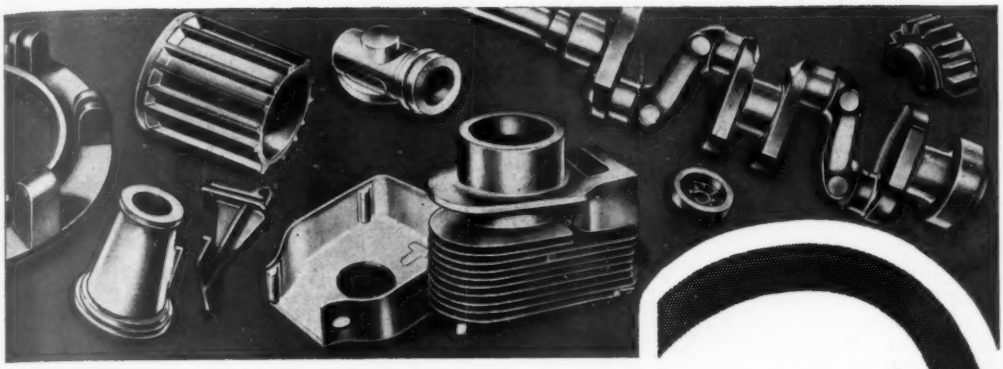

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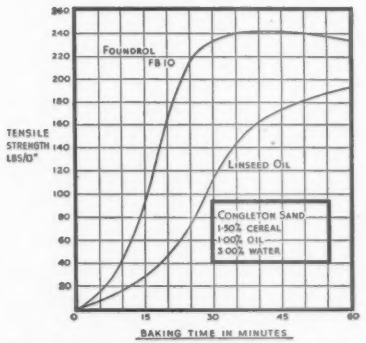

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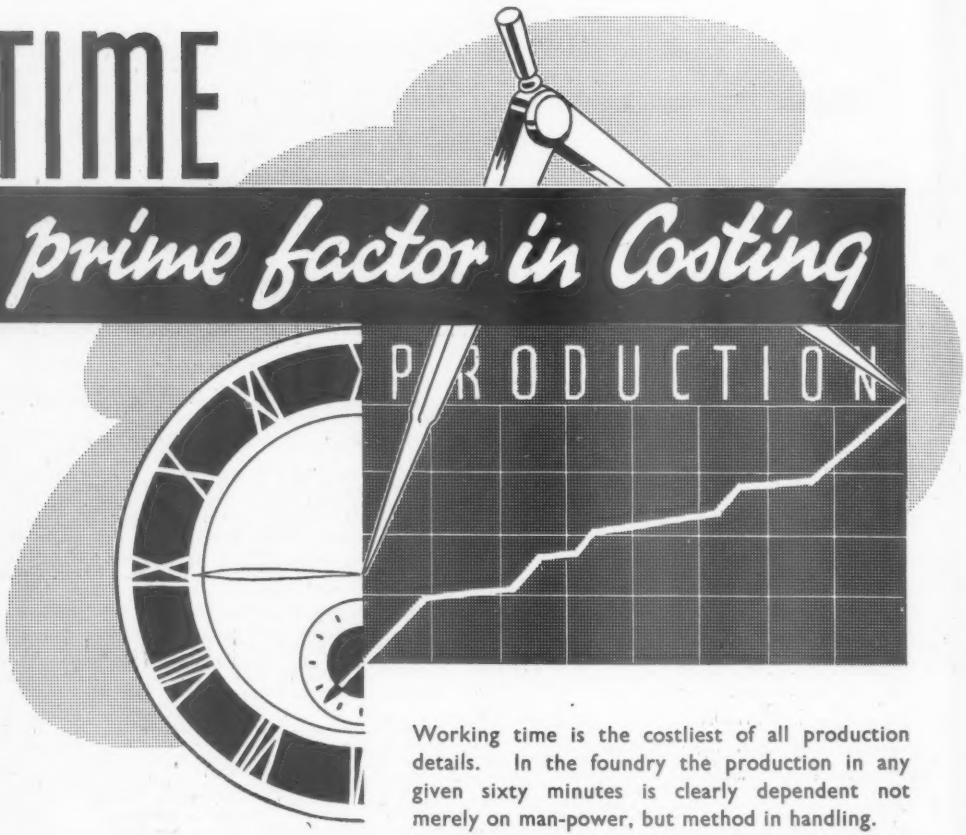

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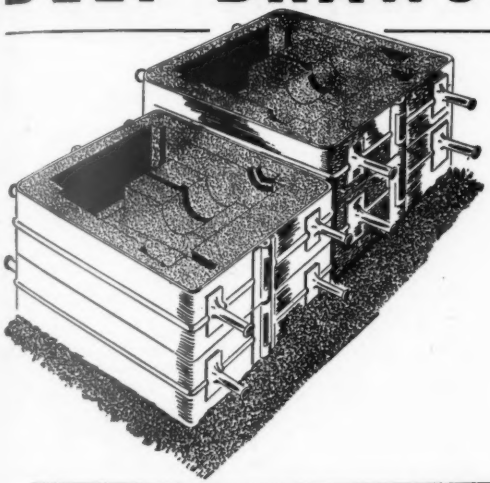

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Ferro-silicon (6-ton lots and over).—45 per cent. Si, £48 0s. 0d. to £50 5s. 0d., scale 16s. 0d. to 17s. 6d. per unit; 75 per cent. Si, £70 0s. 0d. to £73 2s. 6d., scale 16s. 0d. to 17s. 6d. per unit.

Ferro-vanadium.—50/60 per cent., 27s. 6d. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 11s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £250 0s. 0d.; 38/40 per cent., £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 18s. 0d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 21s. 0d. per lb. of W.

Ferro-chrome (6-10 ton lots).—4/6 per cent. C, £93 10s. 0d. to £95 0s. 0d., basis 60 per cent. Cr, scale 29s. 9d. to 32s. 0d. per unit; over 6 per cent. C, £92 10s. 0d. to £93 0s. 0d., basis 60 per cent. Cr, scale 29s. 9d. to 32s. 0d. per unit; 2 per cent. C,* 2s. 1d. per lb. Cr; 1 per cent. C,* 2s. 1½d. per lb. Cr; 0.15 per cent. C,* 2s. 2½d. per lb. Cr; 0.10 per cent. C,* 2s. 2¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 0d. to 7s. 6d. per lb.

Metallic Manganese.—93/95 per cent., carbon-free, £249 0s. 0d.; 96/98 per cent., £259 0s. 0d. to £265 0s. 0d.

Ferro-columbium.—65/75 per cent., Nb + Ta, 24s. to 25s. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £66 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £28 19s. 0d.; tested, 0.08 to 0.25 per cent. C, £29 19s. 0d.; hard (0.41 to 0.60 per cent. C), £31 0s. 6d.; silico-manganese, £39 10s. 0d.; free-cutting, £33 3s. 0d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £36 14s. 6d., silico-manganese, £39 17s. 6d.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £34 13s. 6d.; basic, hard, over 0.41 up to 0.60 per cent., C, £35 16s. 0d.; acid, up to 0.25 per cent. C, £38 17s. 6d.

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Heavy Plates and Sections.—Ship plates (N.-E. Coast), £35 7s. 0d.; boiler plates (N.-E. Coast), £37 17s. 0d.; floor plates (N.-E. Coast), £36 16s. 0d.; sectional material, N.-E. Coast, £33 16s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested (4-ton lots), £36 3s. 0d.; flats, 5 in. wide and under (4-ton lots), £36 3s. 0d.; hoop and strip, £36 12s. 6d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £38 16s. 0d.; black sheets (hand mill), 17/20 g., £50 4s. 6d.; galvanized corrugated sheets, 24 g., £62 9s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £61 13s. 9d.; nickel-chrome, £85 10s. 6d.; nickel-chrome-molybdenum, £96 16s. 6d.

NON-FERROUS METALS

Copper.—Cash, £294 0s. 0d. to £294 10s. 0d.; three months, £295 0s. 0d. to £295 10s. 0d.; settlement, £294 10s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 11½d. per lb.; rods, 334s. 9d. per cwt. basis; 20 s.w.g., 368s. 0d. per cwt.

Tin.—Cash, £749 0s. 0d. to £750 0s. 0d.; three months, £740 0s. 0d. to £741 0s. 0d.; settlement, £750 0s. 0d.

Lead (Refined Pig).—Second half June, £113 0s. 0d. to £113 5s. 0d.; second half September, £111 5s. 0d. to £111 10s. 0d.

Zinc.—Second half June, £94 5s. 0d. to £94 10s. 0d.; second half September, £92 10s. 0d. to £92 15s. 0d.

Zinc Sheets, etc.—Sheets, 15 g. and thicker, all English destinations, £127 10s. 0d.; rolled zinc (boiler plates), all English destinations, £125 5s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £110.

Brass Tubes, etc.—Solid-drawn tubes, 2s. 4¾d. per lb.; rods, drawn, 3s. 3½d.; sheets to 10 w.g., 316s. 6d. per cwt.; wire, 3s. 0¾d.; rolled metal, 301s. 6d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £185; B6 (85/15), —; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £252; HTB2 (38 tons), —; HTB3 (48 tons), £270.

Gunmetal.—BS1400, LG2 (85/5/5/5), £270; LG3 (86/7/5/2), £273; G1 (88/10/2/½), —; (88/10/2/1), £328.

Phosphor Bronze.—BS1400, PB1 (AID released), £345 per ton.

Phosphor Bronze Strip, etc.—Strip, 436s. 6d. per cwt.; sheets to 10 w.g., 461s. 0d. per cwt.; wire, 4s. 6¾d. per lb.; rods, 3s. 9¾d.; tubes, 3s. 8d.; chill cast bars: solids 3s. 9¾d., cored, 3s. 10¾d. (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 4s. 1d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 5¾d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 4¾d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 4d. per lb. Antimony, English, 99 per cent., £210 0s. 0d. Quicksilver, ex-warehouse, £87 0s. 0d. Nickel, £519 0s. 0d. Aluminium ingots, £189 0s. 0d.; aluminium bronze (BS1400), AB1, £295; AB2, —. Solder, brazing, BS1945; type 8 (50/50), 3s. 1d. per lb., type 9 (54/46), 3s. 4½d. per lb.

* Average 68-70 per cent.

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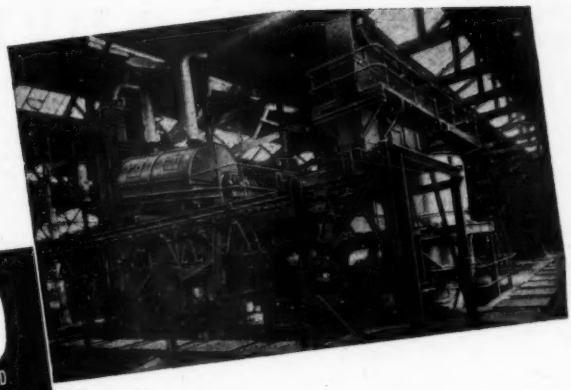

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CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Fifteen words for 7/6 (minimum charge) and 4d. per word thereafter. Box Numbers 2/6 extra (including postage of replies.) Situations Wanted 2d. per word.

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House, 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

YOUNG Man (26), at present ASSISTANT to director of large Non-ferrous Foundry, seeks remunerative position with good prospects. Experienced in weight calculating, estimating, sales and general administration, personally contacting customers. Clean driving licence. Not afraid of hard work. Housing assistance essential.—Box YM169, FOUNDRY TRADE JOURNAL.

METALLURGIST (26), H.N.C. (C. and G.), desires position as ASSISTANT FOUNDRY MANAGER. Presently holding responsible supervisory position in Iron, Steel and Non-ferrous Foundry. Experienced sand slinger, jolter, and wide range of jobbing up to 5 tons. Work study, production and labour control, furnace operation, sand control and development work on modern foundry techniques.—Box MT163, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

JUNIOR METALLURGIST required by old-established Birmingham Company for control and development in new Steel Foundry. Practical experience in steel melting an advantage. Age 20/25. Salary dependent on age and experience. State full details and salary required.—Box JM167, FOUNDRY TRADE JOURNAL.

IRON FOUNDRY in East Midlands invites applications from FOUNDRYMEN under 40 years of age, with previous supervisory experience, for interesting position. Experience in modern green and dry sand practice, with ability to estimate and plan production of quality castings from the drawing stage essential. The position is permanent and pensionable. Excellent welfare and training scheme in operation. House available.—Applications, stating age, experience, and salary desired, to Box IF168, FOUNDRY TRADE JOURNAL.

BOX No. 928 wishes to thank all applicants for the position of Foundry Manager.

FOUNDRY MANAGER required by well-known firm of Ironfounders, producing 60 tons weekly. Experienced in moulding Domestic Heating Appliances. Knowledge of pattern making, metal, labour, and sand control. Floor, Bench, and small mechanisation methods employed. Canteen, Pension Scheme. State, in confidence, full details of experience, age, and salary required.—Box FM170, FOUNDRY TRADE JOURNAL.

FOUNDRY TECHNICAL CONTROL.—An opportunity exists with a progressive company for a young man to be taught foundry technical control. The position would give valuable practical experience to a graduate wishing to specialise in foundry work; or to a laboratory assistant wishing to extend his knowledge of foundry practice. Applicants who desire further information should state their age, and give particulars of education, or present and past employment, and say if they have fulfilled their National Service obligations.—Box FT172, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

ENERGETIC man for small Iron Foundry. Capable and willing to tackle anything. Excellent opportunities, leading to complete management (Bradford). State full particulars.—Box EM175, FOUNDRY TRADE JOURNAL.

A FOUNDRY METALLURGIST is required by a British company for research into and development of sand-binding materials. An appropriate academic qualification is desirable, but enthusiasm and the capacity to inspire and technically lead a sales force is essential. The appointment involves residence in or near London and periodic tours in the U.K. Applications will be treated with strict confidence and should summarise experience, qualifications and education.—Box AF174, FOUNDRY TRADE JOURNAL.

FOUNDRY FOREMAN required for Mechanised Steel Foundry in Doncaster. Applications are invited from men with first-class practical and technical experience, accustomed to accepting responsibility for control of labour, quality, and output. The person appointed would need to become part of, and work with, an existing team of assistants to Foundry Superintendent. This is a staff appointment with Pension Scheme after 12 months' satisfactory service, and is an excellent opportunity for a man of the right calibre.—Please apply in first instance, giving full details of age, qualifications and experience, to JOHN FOWLER & Co. (LEEDS), LTD., Sprotborough Works, Doncaster.

METALLURGIST required for Iron Foundry, South-East England. Experience of melting, sand control, and mechanised production preferred. Pension Fund and Employees' Share Holding Scheme operated.—Write, stating age, experience, and salary required, to Box MR166, FOUNDRY TRADE JOURNAL.

METALLURGISTS required for new modernised Metallurgical laboratory.
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Both positions offer considerable scope in a progressive and expanding organisation. Attractive salary, depending on age and experience. Holiday arrangements honoured.—Apply, stating age, education, and experience, to the EMPLOYMENT OFFICER, Hoover, Ltd., Perivale, Greenford, Middlesex.

SITUATIONS VACANT—*contd.*

IRON MOULDERS (first-class only).—MOYLE, Kingston-on-Thames.

FOUNDRY FOREMAN required for Modern Mechanised Foundry in Shropshire, producing High Quality Malleable Iron Castings. The position calls for a man with personality and ability to get things done. Applicants must be able to deal with problems as they arise, and be able to keep the Plant running at full capacity.—Apply, giving full details of training and experience, together with salary required, to Box FR128, FOUNDRY TRADE JOURNAL.

DRAUGHTSMEN required, preferably with Gravity Die experience. First-class jig and tool draughtsmen wishing to broaden experience might suit. Pension scheme in operation.—Apply JOHN DALE, LTD., London Colney, St. Albans, Herts.

FOUNDRY FOREMAN required to take charge of small non-ferrous foundry in South London. Applicants must be thoroughly experienced in floor and bench work, in yellow metals and aluminium. State experience, qualifications and salary required to Box FF113, FOUNDRY TRADE JOURNAL.

FOUNDRY Equipment Manufacturers have under consideration revision of representation arrangements in England and Wales.—Men having experience in foundry engineering covering installation and servicing or alternatively interested in this type of work are invited to send in confidence full details regarding themselves to Box FE147, FOUNDRY TRADE JOURNAL.

FOUNDRY Plant Manufacturers in the Birmingham area require SENIOR DRAUGHTSMAN, with mechanical handling and/or structural experience, for highly mechanised cupola melting plants.—Full details to PERSONNEL MANAGER, Incandescent Heat Co., Ltd., Cornwall Road, Smethwick.

FOUNDRY FOREMAN, experienced executive for Roll Foundry and other castings.—State experience, qualifications, and wages required, Box FF974, FOUNDRY TRADE JOURNAL.

REPRESENTATIVES WANTED

REPRESENTATIVE wanted for N.W. area (and other areas), for Sales Foundry Sand-Bonding clay material as supplement to existing non-competitive products. Car provided.—Box RW139, FOUNDRY TRADE JOURNAL.

REPRESENTATIVE, with engineering background and existing connection preferred, for London and Home Counties by substantial Foundry having jobbing and repetition iron section, aluminium, sand and diecasting, and general non-ferrous section, machine shop, etc.—Application, with details of experience, salary, and whether car driver, to Box RW176, FOUNDRY TRADE JOURNAL.

REPRESENTATIVES WANTED—*contd.*

OLD-ESTABLISHED Ingot Manufacturer requires energetic SALESMAN; Midlands area.—Particulars, experience and earnings, to Box OE155, FOUNDRY TRADE JOURNAL.

AGENCIES

AGENTS required by progressive repetition Foundry producing brass, gunmetal, aluminium and nickel alloy castings. Also engineering section producing valves, pumps and components.—Box AR138, FOUNDRY TRADE JOURNAL.

ACTIVE London firm of Manufacturers Representatives seeks Agency for sale of Aluminium Die Castings. Good connections in London and Home Counties. Box AL143, FOUNDRY TRADE JOURNAL.

FOUNDRIES FOR SALE

IRON FOUNDRY for sale in Lancashire, equipped for machine and floor moulding. Specially suitable for production of castings up to 100 lbs. weight.—Box FF171, FOUNDRY TRADE JOURNAL.

WEST BROMWICH (main Dudley Road). Valuable freehold foundry property comprising good offices and laboratories, canteen, despatch warehouse, paint dip, pattern, dressing and shot blast shops, lever shop, Cupola House, dome moulding shop, core shop, very good foundries, stores, two garages, ample lavatory accommodation, pair of dwelling houses (let), all main services, valuable yards for building extensions or open storage, floor area 23,000 sq. ft., site area 7,047 sq. yds. Certain plant, etc., included. Possession. Ref. A/4620. EDWARDS, SON & BIGWOOD & MATHEWS, 158, Edmund Street, Birmingham, 3. Telephone CENtral 1376-9.

GOVERNING director of prosperous small Non-ferrous Foundry in North Midlands wishes to retire shortly after 34 years activity with firm. Modern foundry (75 per cent. freehold), well equipped to cater for specialised work to customers of national repute, also general jobbing work. Business has been in one family at least 100 years. Orders in hand **fill capacity four** months ahead. Would consider **outright** sale, **retain** part interest, or other **suitable** arrangement.—Box GD162, FOUNDRY TRADE JOURNAL.

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ONE No. 3 size ULTRA RAPID CUPOLA, 2 tons per hr. Two rows of Tuyeres Cleaning Type Spark Arrester, 6 ft. dia. Blower, Fan and Motor combined, 4 h.p., 3-phase, 380 volts. Starter and staging complete as erected. Made by Alldays & Onions, Ltd.
SHOTBLAST UNIT complete, manufactured by J. W. Jackman & Co. Electrically driven by 27 h.p. Motor, wound for a current supply of 380 volts, 3-phase, 50 cycles, with starter, comprising:—
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Large quantity of new air receivers, Broomwade, 100 lb. p.s.i. Up to size 5 ft. × 2 ft.
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ONE 2-ton Electric Loading Hoist, by Pickerings, Ltd., three stations. Distance between decks, ground to first stage, 6 ft. 9 in., first to second stage 8 ft. 9 in., cab 12 ft. 6 in. by 6 ft. 10 in. Speed 60 ft. per min., with electric drive and automatic control panel, for 440 volts, 3-phase, 50 cycles, a.c. Push button calling and despatching. Cab arranged for entrance by one long side or two ends. In good working order; open for inspection.

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WINGET MOTOR BARROW for sale. Very little used. Under a year old. MOYLE, Kingston-on-Thames.

FOR SALE. Hand Operated Shell Moulding Plant complete with all equipment unused, will sell as a whole or in parts. Box HO131, FOUNDRY TRADE JOURNAL.

NEW Portable Power and Suspending Riddling Machines, from £38 10s.—D-M-TOOLS, Jagger, Arterial Road, Basildon, Essex.

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VITREOUS ENAMELLING.—Capacity available for enamelling castings in all finishes (plain, mottle, marble, lustre, etc.). Prompt delivery by our own transport.—THE RUSTLESS IRON CO., LTD., Trico Works, Keighley, Yorks. Tel.: Keighley 3737.

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IMMEDIATE Capacity available for High Pressure Resisting Iron Castings (1,500 lbs. per square inch hydraulic), also Motor Cylinders, heads, and similar class work. Boxes for running jobs 16 in. × 14 in. and 24½ in. × 17½ in., other sizes for specials. Shell moulding up to 24 in. × 18 in. single shell area. Full Patternmaking facilities available if required.

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'Phone Hockley 337 or London Victoria 7436.

CAPACITY available for High Quality Light Grey Iron Castings of all descriptions. Economic prices and quality assured.—Box CA173, FOUNDRY TRADE JOURNAL.

ENQUIRIES invited for engineering castings in C.I. up to 12 cwt. Capacity of 2½ tons per week available. HOMO METALS, LTD., West Hartlepool.

CAPACITY AVAILABLE—*contd.*

CRAY ALLOYS, LTD., have capacity for the manufacture of Aluminium Gravity Die Castings.—Write with confidence to CRAY ALLOYS, LTD., Leesons Hill, St. Mary Cray, Kent.

ALUMINIUM foundries requiring toolmaking capacity for Gravity Die Manufacture should apply to:—DIXON & MUGGERIDGE LIMITED, 241, Main Road, Sidcup, Kent. Footscray 1395.

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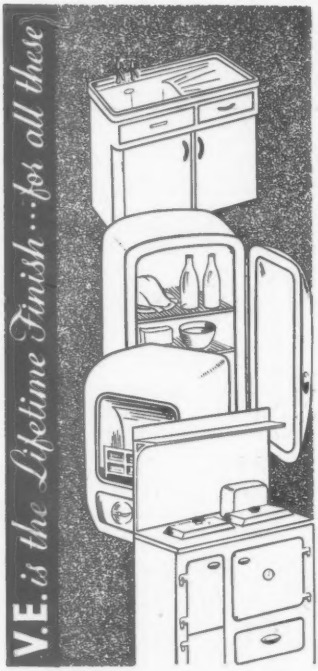

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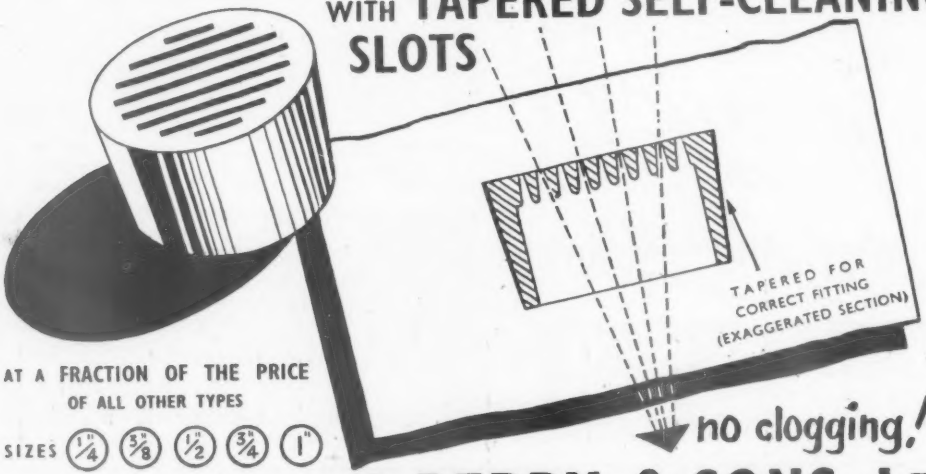

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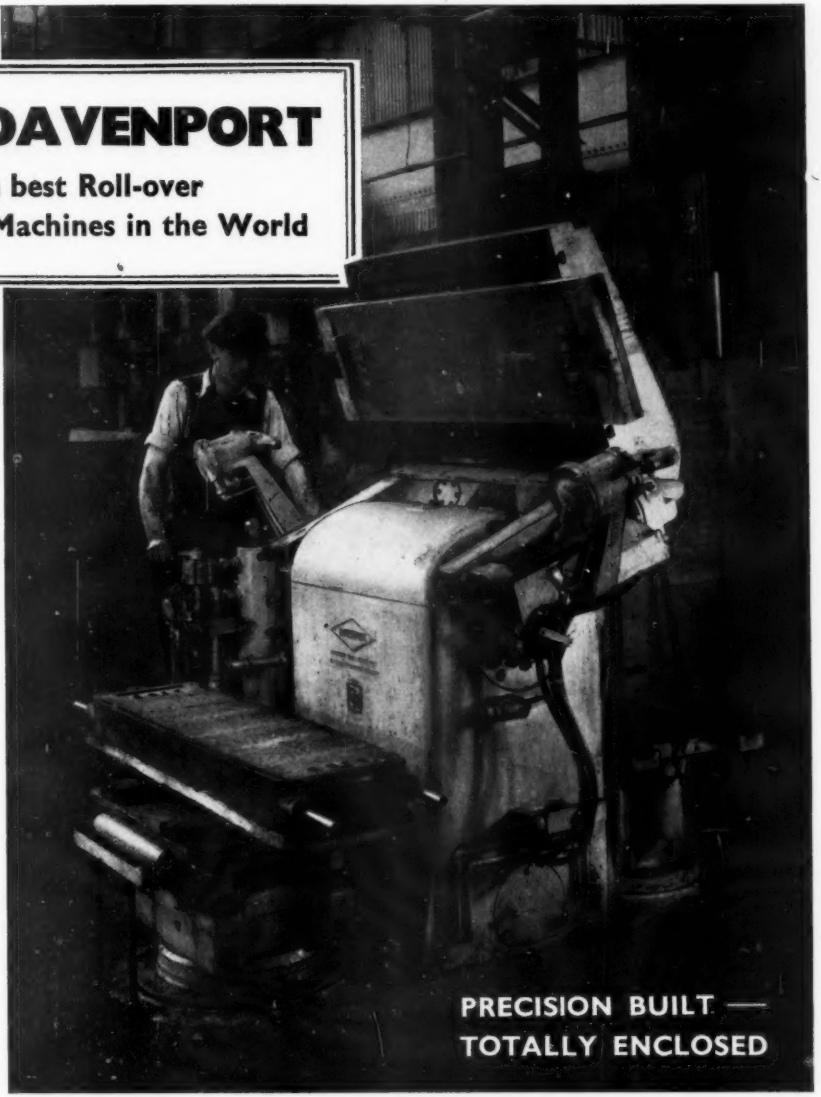

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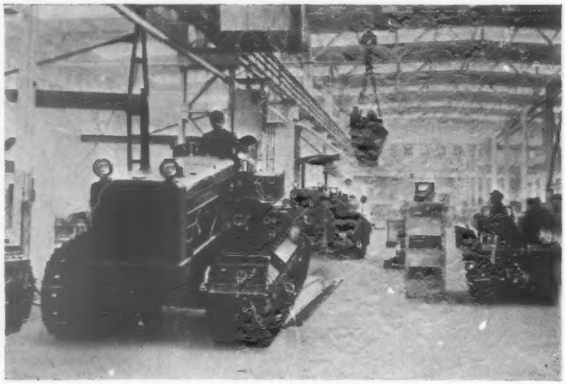

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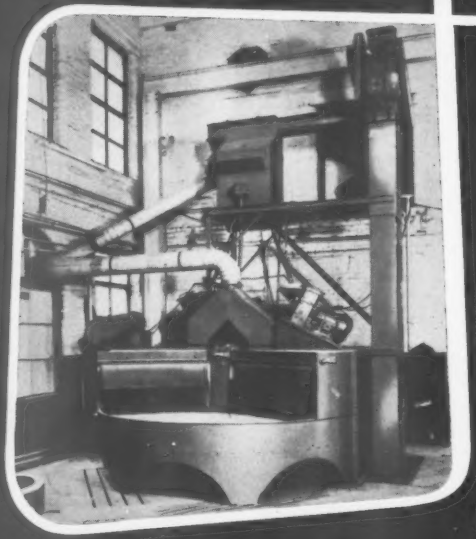

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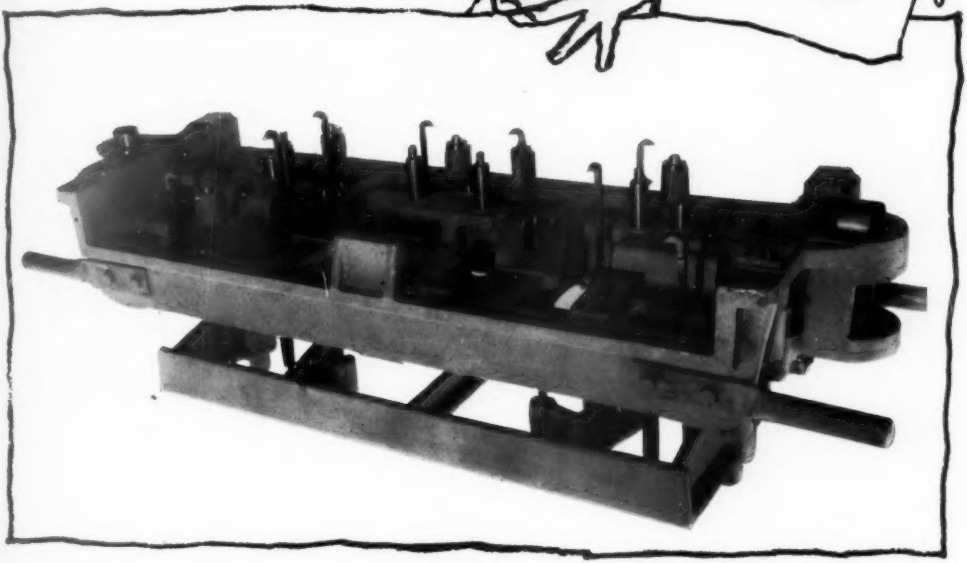

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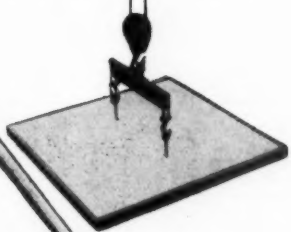

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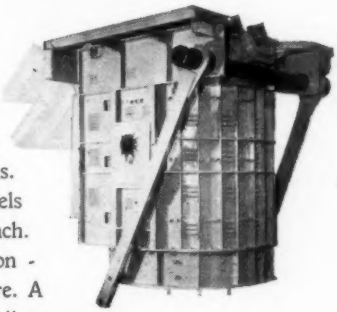

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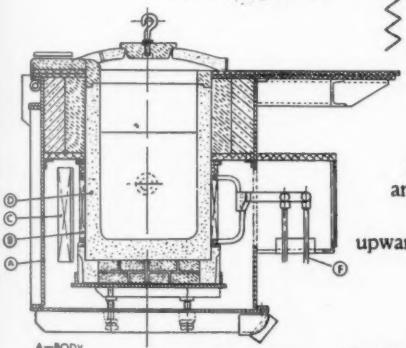

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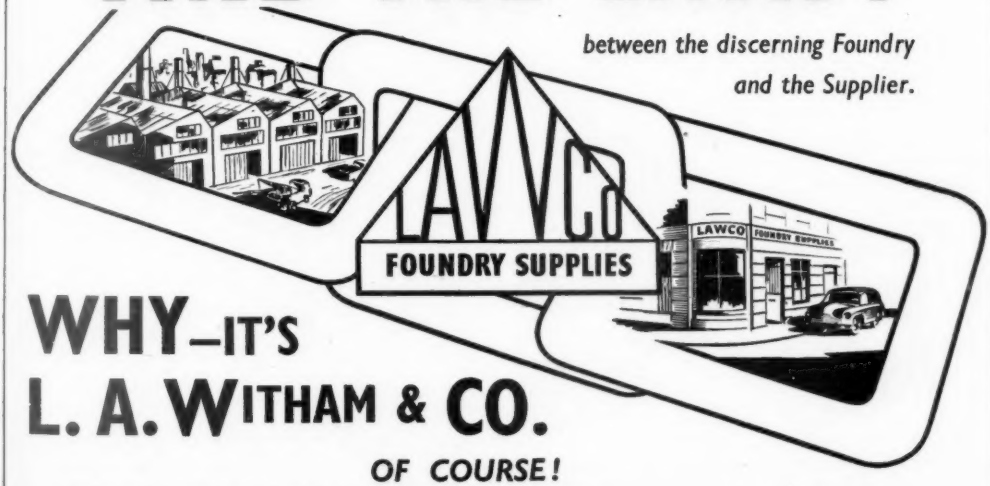

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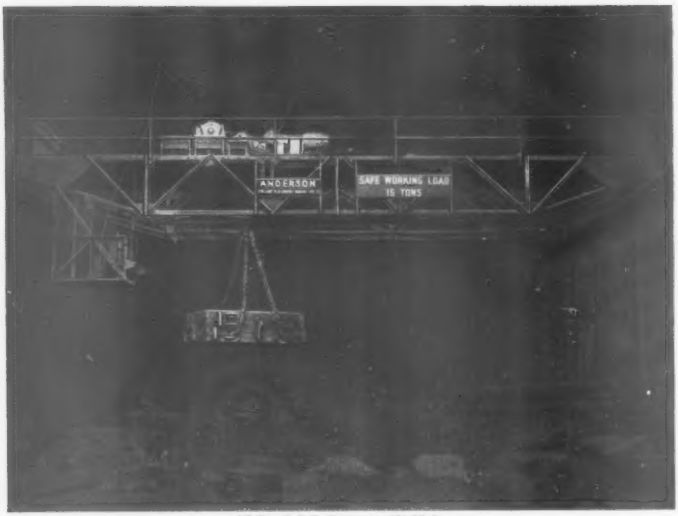

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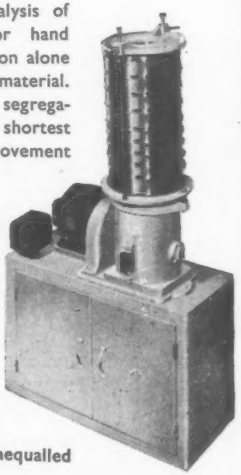

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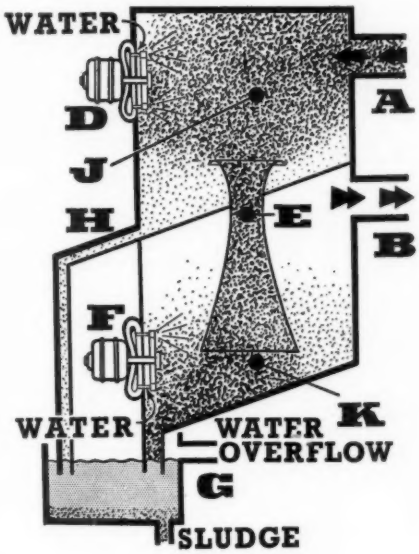

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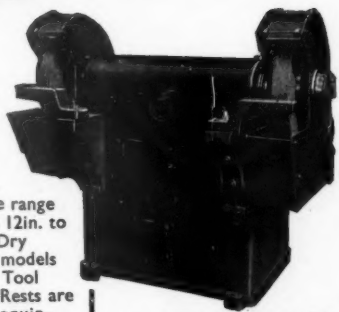

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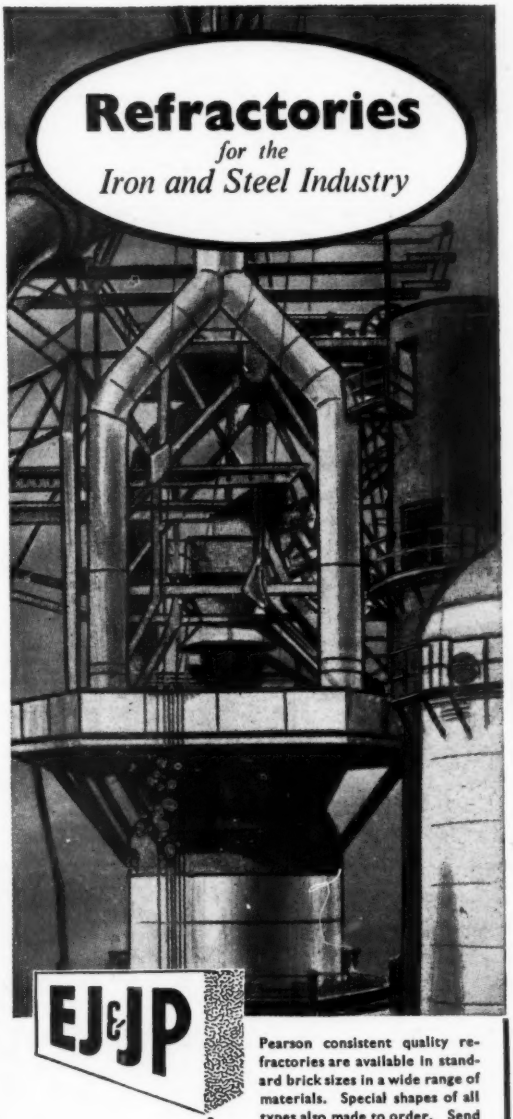

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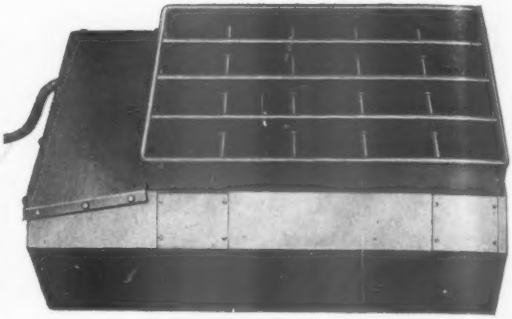

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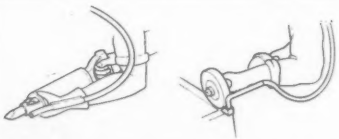

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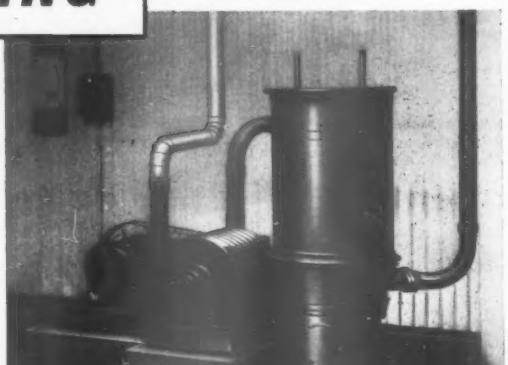

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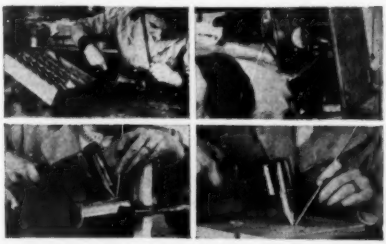

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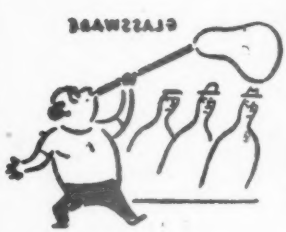

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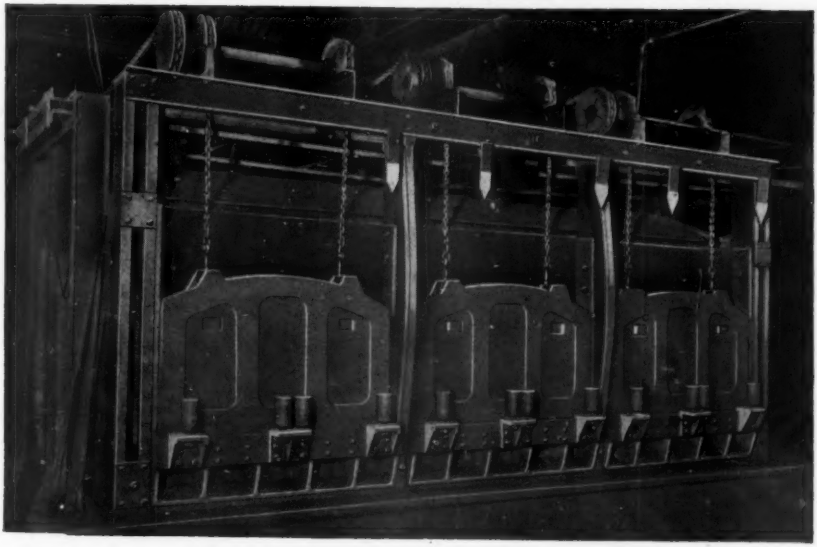

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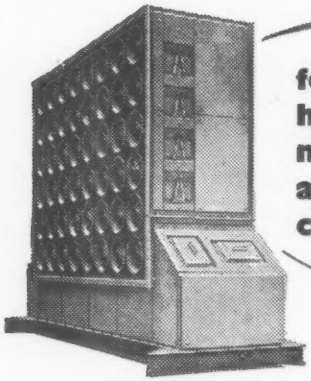

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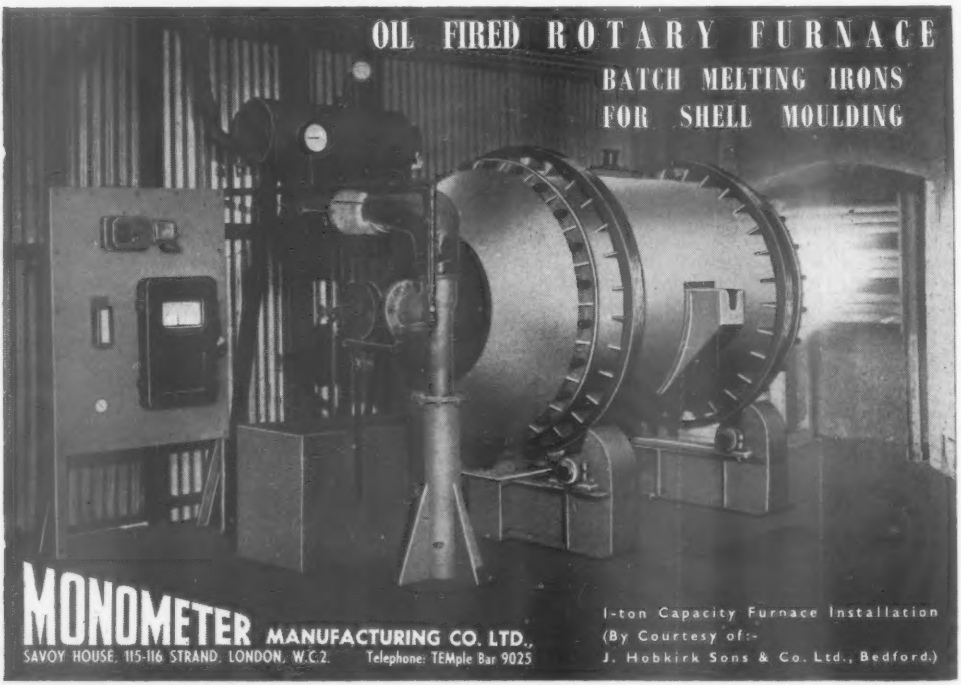
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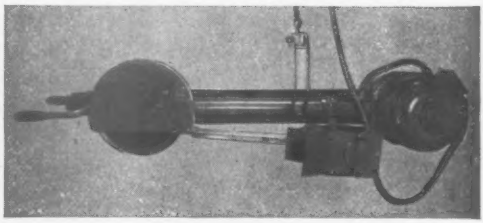

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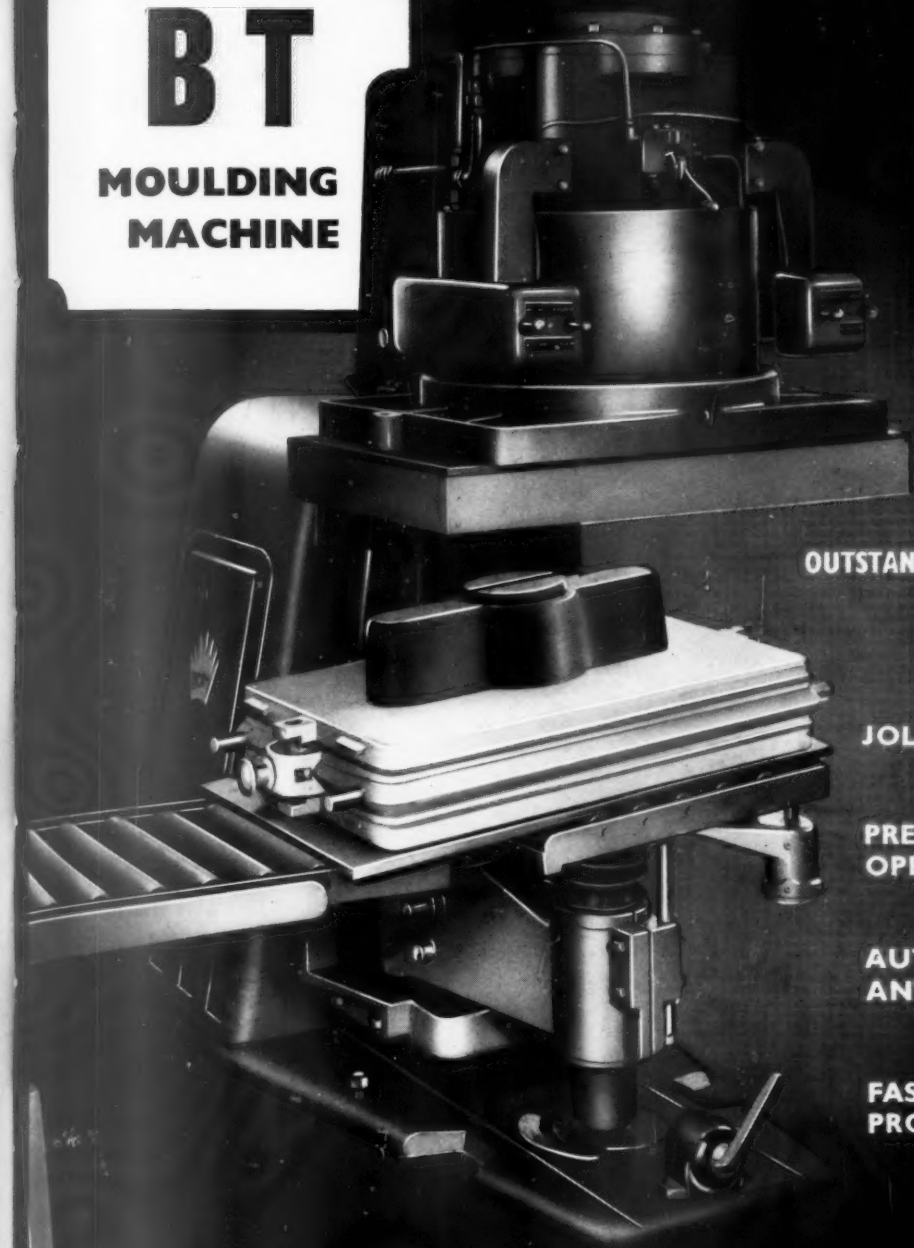

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